NAVY CIVIL ENGINEER

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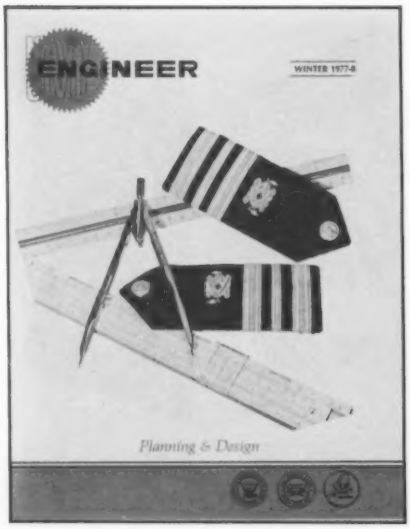

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IN THIS ISSUE

Encroachment 4
By CDR Joseph J. Gawarkiewicz, III, CEC, USN

Capital Improvement Plan 6
By Donald B. Pledger

Acquisition of New Naval Properties 7
By W. J. Woods

Staff Civil Engineers 8
By LCDR Charles S. Prahl, CEC, USN

When a Community's Plans Disagree With The Navy's 10
By LT John G. Sims, CEC, USN

An Anatomy Of A Master Plan 12
By Jack Dirks

Post Occupancy Studies 14
By George E. Baer

Economic Analysis of Overseas Family Housing 15
By James J. Carberry

NAVFAC/CEC/Seabees Family Album '77 16

Shore Facilities Planning System 18
By Robert E. Myers

Study The Entire Mediterranean 20
By Francis E. Rohde

Memorials: RADM A. C. Husband and
RADM R. H. Meade 23

NAVFAC Situation Report 24

Facilities Asset Data 25
By Barbara Boslego

Index, The Navy Civil Engineer, 1977 26

San Diego's 'Total Engery' Plant 28
By J. N. Williams

Speaking From Topside 30
By RADM K. P. Sears, CEC, USN

STAFF CIVIL ENGINEERS — An author reviews the staff civil engineer *assignment* and evaluates the current effectiveness of the billet. Refer to page 8.

SEABEE FACELIFT — A cosmetic treatment to the Pearl Harbor emblem is seen on page 17 together with other photographs for the NAVFAC/CEC/Seabee 'family' album.

PLANNING & DESIGN — As the front cover reflects, this issue contains subject oriented articles identified by the T-square symbol.

By CDR JOSEPH J. GAWARKIEWICZ III,
Assistant For Facilities,
Planning & Real Estate
CEC, USN, E.I.T., N.Y.

• Washington, D.C.

Encroachment—is now a commonly used term within the Navy shore establishment. There had been a general recognition of the threat of encroachment, but no longer, as today the threat is real and emanating from a variety of sources.

Encroachment is any external action planned or executed in the vicinity of a naval activity which inhibits, curtails or possesses the potential to impede the performance of the mission of the installation. There have been, however, efforts to halt encroachment. For instance, Project Guardian was established in 1975 to collect information of specific intrusions or threats upon Naval properties. The Air Installations Compatible Use Zones (AICUZ) program was originated to protect Naval and Marine Corps Air Stations from outside influences that could trespass upon normal operations. A study of all encroachment aspects has been completed by the Navy and has been forwarded to major commands for review.

In Fiscal Year 1977, two naval activities terminated their long standing mission and closed their gates. NAS Los Alamitos was gradually surrounded and then enveloped by the urban sprawl of the Los Angeles/Long Beach metropolitan area. As a result of community pressure, the aviation activity was reduced from jet to propellor aircraft operations. Then expansion of a nearby retirement community continued with the eventual result of the termination of all naval air activities. It must be recognized that the physical encroachment was not the only factor but it was a major contributor to the closure. Similarly, St. Julien's Creek Annex of NWS Yorktown was closed for ordnance functions due in large part to population growth and industrial development within the Explosive Safety Quantity Distance (ESQD) arcs. These examples are the culmination of gradual encroachment.

Other naval activities are suffering progressive intrusion upon their areas or missions. For example, NWS Seal Beach and Concord, Calif., have downgraded magazine loadings to keep ESQD arcs within base boundaries. Operational restrictions and modifications have been experienced at various air activities as a result of varied external demands. Examples include: flying precise narrow entry/exit corridors from NAS Miramar and Oceana; increasing the glide/climb angle at NAS Alameda and MCAS El Toro; landings and takeoffs on one end of the runway at NADC Warminster; restrictions of night operations at NAS Glenview; and restriction of the airfield to prop aircraft at Moffett Field and Glenview.

Population growth and distribu-

various external influences are restricting the naval mission

tion is the principal and dominant source of encroachment and is a contributing factor to all other sources. As such, it merits some discussion, particularly with new trends in national growth and distribution evidenced.

The projected population growth of the U.S. in 1990 will be approaching 250 million.

Since World War II, there has been an unmistakable shift from rural to metropolitan areas and since many of our cities are in coastal areas, a shift to the cities was synonymous with a shift to the coastal areas, with the obvious impact on naval shore facilities. The assumption was that the shift to coast areas would continue through this century; however, in the period 1970-75, the average change in population for inland states was 6.5% compared to 6.8% for coastal states, an inconsequential difference.

Instead, the surprising shift in population is a strong movement to the "sunbelt" (the 14 states below 38° N latitude plus Virginia), and especially to smaller communities and rural areas. For the first time the majority of Americans live in the south and west and this relocation of population has happened since 1970. Eleven of the 13 fastest growing cities in the nation are located in the sunbelt.

A look at the growth around major fleet centers gives an indication of the encroachment problem. The centers reviewed include Bremerton, Charleston, Honolulu, Jacksonville, Long Beach, New London, Norfolk, Pensacola, Philadelphia, San Diego and San Francisco. All but Philadelphia have experienced a growth rate higher than the U.S. average.

Five cities—Charleston, Jacksonville, Long Beach, Pensacola and San Diego—are projected to grow over 40% faster than the U.S. average. San Diego is the fastest growing Navy city, with a rate 154% higher than the U.S. average.

Another measure of growth is the increase in contract construction. The cities experiencing the greatest increases in contract construction in the 70s period include Pensacola, San Diego, Norfolk and Charleston. The cities of Honolulu, Long Beach, Philadelphia and San Francisco show relatively slow growth, probably due to their already high density development.

The trends are becoming clear. We are experiencing the last remnants of a 30-year population shift to the metropolitan areas and the early beginnings of a migration to the sunbelt. Mounting pressure on Navy shore installations in metropolitan areas in the south and west will bear the brunt of encroachment problems with no signs of relief in this century.

The community and environmental pressures near air stations is well known and has been recognized and highlighted through the AICUZ program, and various strategies ranging from compatible zoning to land acquisition have been employed at individual installations.

The encroachment due to population growth has affected more than air stations. Ordnance facilities, for instance, have been severely restricted with their missions degraded and storage capability reduced. Seal Beach, Calif., is the perfect example, with the local community built up to the base perimeter, causing a reduction in storage and the necessity of sharing the shipping channel with small craft traffic from neighboring marinas.

Air range operations are becoming reduced by encroachment through population, industrial or recreational growth in their general vicinity. This is the case for most ranges including the North Carolina ranges, the Florida ranges and the Southern California ranges.

Population growth is the underlying cause for other types of infringement of normal operations. Electromagnetic Interference (EMI) from off-base sources is the man-made noise resulting from residential, commercial and industrial sources and includes household appliances, power generation and distribution, vehicles, office equipment, computer systems, and machinery. The major impact of EMI encroachment to date has been in receiving rather than in transmitting systems. Little is known of the actual EMI encroachment at individual activities. A survey of 546 locations throughout the world, including all types of naval activities, showed that off-base EMI data was available on only 28 locations, of which 16 had significant EMI.

Energy supply problems can become another "encroachment" conflict. Competition with the rest of the country for limited energy resources entails the expense of higher priced energy supplies as well as huge capital investment required to convert to alternate methods. Another form of 'energy encroachment' is where an energy resource is actually within a Navy base. The best example of this is NWC China Lake which is conducting geothermal exploration within its boundaries. The China Lake geothermal field is estimated to have a capability of producing 4600 megawatts wtih a life expectancy in excess of 100 years. This equates to the power requirement of Los Angeles. The obvious encroachment threat is ensuring the compatability of a geothermal commercial development with the naval mission of the region. National interests may well rank *energy interests* over *defense interests* thus causing severe mission degradation or relocation at NWC China Lake.

Possible encroachment on water supplies involves those locations where the Navy has developed surface water impoundments which could become a target for sharing with an enlarged civilian population. It also involves locations where the Navy purchases its water from public sources and is subject to the same drought risks as the local community. The 1977 drought in California and Virginia, with

encroachment

(Continued from preceding page)

the stringent cutbacks and conservation measures instituted at bases, are examples. Regional water shortages such as one predicted for the Virginia Beach area also will reflect on NAS Oceana operations.

The myriad of environmental and natural resource legislation over the last 10 years limits the Navy's ability to act.

Transportation systems can interfere in a variety of ways. Public highways bisect bases (for instance, NWS Yorktown and NWS Concord) with a resultant loss in ordnance handling capability. There are current initiatives for public roads through other bases. Ocean systems are congested at the ports and, along with the increased harbor traffic, commercial and industrial expansion surrounds naval bases. There are initiatives in some areas to turn over portions of Navy bases for commercial use. Such is the case in Charleston, San Diego and Norfolk.

Air systems in congested air space result in occasional initiatives to collocate commercial aviation on military air bases, such as NAS Miramar.

Offshore exploration and development for oil and gas can reduce Navy operating areas and could eventually cause relocation of these areas further seaward.

Recreational interests, evidenced by the growing number of small boats in harbor traffic and general aviation which now accounts for 75% of all airfield operations, conflict with efficient naval operations when the two interests overlap.

Encroachment difficulties, regardless of source, have not been wholly recognized or appreciated, primarily because of the piecemeal nature of the degradation of operational capability.

Steps must be taken to solve encroachment problems to protect both the naval mission and the investments in vital installations. Strategies are now being developed in much the same manner as the AICUZ program to protect the Navy's requirements in those areas which may be subject to conflicting inroads by other interests.

Capital Improvement Plan

By DONALD B. PLEDGER
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NAVFACHQ.

• Alexandria, Va.

To perform shore facilities planning more effectively and to utilize professional planning resources, NAVFAC and its engineering field divisions (EFDs) are studying a new strategy for intermediate range planning.

NAVFAC has almost reached the milestone of providing master planning services to all Navy and Marine Corps installations by providing each activity with a master plan. As the program switches to one of updating these documents, the program will be modified. Past master plans have covered elements of planning from macro scale concerns of the region and vicinity to more minute details of facility siting, parking requirements, and even, in some cases, landscape design and development. As a result of including detailed concepts, the master plans often were outdated before they were printed and distributed.

Reviews of planning policies of the civilian community indicate that master plans prepared for cities and counties project land use patterns and infra-structure requirements (roads and utilities), but stop short of implementation of details. The local governmental planners issue an annual, or biannual, capital improvement plan (CIP) to convey the details of the master plan. Specific information concerning scope, phasing, funding, design, and construction is presented in the CIP.

The benefits for the Navy in following the civilian method are apparent. By removing from the master plan that information most closely related to construction programs, and leaving only that information that deals with the existing activity, its assets, its problems, and its needs, the master planning document may stay current for a number of years. The cut-off point for the Navy/Marine Corps master plan would be, as in the civilian world, the proposed land use plan. For the activities where facility and real estate problems require a high level of attention, the master plan may need to be updated as frequently as every three years. However, for activities where few problems or little facility activity occur, master plans might well remain useful for six to nine years.

When the activity master plan is updated, a new CIP would be developed. For activities having a significant level of changing requirements or construction, the CIP's would be updated on an annual basis.

The CIP has been designed not only to aid in the implementation of the master plan, but as a tool for the activity, the sponsor, and the NAVFAC EFD in preparing, proposing, supporting, and reviewing projects in all funding programs. The CIP contains the following minimal information:

- A list of projects, including project scope and estimated cost. The specific projects to be included will be those which the activity, the sponsor, and the EFD view as being essential in the development of the activity.
- Phasing of projects to indicate necessary sequential construction.
- Priority listing of projects by each funding source.
- The identification of all restrictions associated with the project, for instance, explosives safety, flight safety information, pollution control, statutory requirements, flood control, and endangered species protection.
- A site plan showing the location of the project relative to man-made and natural features. The site plan will be utilized, together with constraint information, in obtaining required site approvals from Department of Defense, Chief of Naval Operations, and Chief of Naval Material review agencies.

The format of the CIP will be simple and utilitarian, essentially a throw-away at the end of its usefulness. It will hopefully bridge the gap between land use planning and Military Construction programming.

Acquisition of new naval properties

By W. J. WOODS
Director, Real Estate Division
Southern Division, NAVFAC

• Charleston, S.C.

The Navy's requirements for new real estate properties are met through orderly acquisition processes executed by the appropriate Engineering Field Divisions (EFD) of the Naval Facilities Engineering Command (NAVFAC).

Before the project is funded in the military construction program, a land planning report is prepared containing maps, descriptions, ownership information and appraisals of the properties proposed for acquisition.

The report, prepared by the EFD, provides recommendations of specific boundary lines, interests to be acquired, whether or not mineral rights should be purchased, and other pertinent matters together with an estimate of project costs. Upon approval by Headquarters, NAVFAC, the land planning report is used as a support document in seeking Congressional authorization.

When the land acquisition becomes authorized, new appraisals are made to arrive at a current fair market value. The re-appraisals are obtained by a provision in the original appraisal contract which provides for updated valuations within a certain time period and at a specified contract fee.

If only a portion of an ownership is required, the appraisal will cover not only the part to be taken, but also will reflect the effects the project will have on the owner's remaining property. When the remainder is rendered less valuable by reason of the partial purchase, the owner is entitled to the amount of the diminution of value of the remaining parcel. It could be, of course, that the remaining lands will benefit from the project and will realize an enhancement in value. Under these circumstances the value of enhancement is credited against the value of the part to be acquired.

Appraisals furnished by contract appraisers are carefully reviewed by staff appraisers at the EFD and approved values are certified for offers to the landowners. Individual parcels which have a value in excess of $250,000 require approval by the chief appraiser at NAVFAC HQ.

A written offer to purchase is made to landowners within the project area based on the approved appraisal. Public Law 91-646 governs how the offer is tendered, and requires that a summary of the essential elements of the appraisal be furnished with the written offer. It's worth mentioning here that "fair market value," or the price which the property would probably bring on the open market, is the basis for purchase negotiations. The law requires that the original offer must not be less than the agency's approved appraisal of the property.

Negotiators of the EFD real estate division conduct negotiations with landowners until either a signed purchase agreement at an acceptable price is obtained or negotiations prove unsuccessful and are terminated. If the negotiation ends successfully, updated title evidence is obtained and the EFD counsel effects the closing.

If, on the other hand, negotiations fail or if the title to the property cannot be cleared, a condemnation assembly is forwarded to NAVFAC for the approval of the Secretary of the Navy. Upon concurrence, the file is sent to the Department of Justice requesting that condemnation proceedings be instituted. The Department of Justice files a condemnation together with a Declaration of Taking through the local United States attorney. The amount of the Navy's appraisal is deposited with a Federal Court and title to the property passes to the Government at the time the declaration is filed. The determination of just compensation may remain for later trial unless settlement is made through the Department of Justice.

The same procedure is followed in the acquisition of lesser interests such as easements for various purposes. Only those rights which are needed to serve the Government's proposed use are acquired.

Where owners or tenants are displaced as a result of the Government's project, the law requires a complete and detailed relocation plan before acquisition can begin. Advisory and monetary assistance is provided to homeowners and businesses required to find other locations.

Staff Civil Engineers

Are they doing the job originally intended?

By LCDR CHARLES S. PRAHL, CEC, USN
Director
Facilities Management Division
CECOS
P.E., Pa.

• Port Hueneme, Calif.

Consolidate and reduce overhead!

We in the CEC have heard this phrase often in the past several years and, like good sailors, we have indeed consolidated, especially in our public works business.

The best example of our efforts is the Public Works Centers (PWC). We now have nine of them, each replacing several public works departments (PWD). Established as separate commands, the centers provide plant management services on a reimbursable basis to naval activities in their vicinity.

Interesting thing, though, all those commanding officers who lost their PWDs in our consolidations continue to be held responsible for the material condition of their facilities. They continue to be funded by their bosses, the major claimants, to carry out this responsibility. Where once the commanding officer had his PWD staffed to make good plant management decisions and execute them, he now must deal with a PWC which does only what it is told to do and only what it is paid to do.

Not to worry, the command is told. After all, the CO of the Center proclaims himself as your Public Works Officer (PWO) and says his staff is your staff, ready to do your beckoning. He says this, of course, to scores of other commands and should one go to the Center with anything short of a white hot item, he can expect to be told to get in line.

Fortunately, NAVFAC recognized the need to provide at least major activities served by a public works center with some degree of facility management expertise. That is, NAVFAC elected to establish the billet of Staff Civil Engineer (SCE), a CEC officer assigned to the activity served. His job is to provide a command with experienced facility management talent to enable intelligent decisions on how to use its limited facility maintenance and operations resources to best advantage.

In brief, from the standpoint of looking up to the activity CO and out to his departments, the staff civil engineer is like a public works officer. The only difference is that when he looks down at his department, no one is there. He has to go elsewhere — usually to the PWC with dollars in hand and buy the services he wants. To quote an OPNAV Notice which formalized all this, "Staff Civil Engineers shall be attached directly to shore activities in all instances where full time efforts of a qualified CEC officer are necessary to administer the volume and/or complexity of public works support required."

All this sounds keen.

Like many things, however, there are many difficulties. Let's discuss a couple. First, the fact that staff

. . . the author opines that things are not as good as they should be for the Staff Civil Engineer and offers a few suggestions . . .

civil engineers are assigned only to major activities (shipyards, naval stations, etc.) should make it apparent that experience in public works is mighty desirable prior to becoming an SCE.

In fact, there is a substantial number of SCEs who have no such experience, or have so little that it is of marginal value. Normally, these fellows are very competent junior officers and, in short order, are able to get things done through the PWC.

Facility administration, though, is a big business, requiring sophisticated management if one is to carry out his responsibilities to the command and to the taxpayer. Without any experience in the field, these officers may not easily appreciate what they should be doing. Oftentimes, the intensity of the job can be overwhelming. One becomes so busy battling paper work and crises that he has little time or inclination to attempt real management or to recognize that he is not managing but is performing as an 'in-basket' administrator. Rather, he deals with problems as they come in and perhaps enjoys the feeling that he is a big wheel on his base. Such a strategy will keep one busy enough, but it would be difficult to classify this as management. Getting things done is an accomplishment of administration. Getting the job done is an act of management and involves much more, such as identifying and assigning priorities to public works objectives and then achieving them within available resources.

One might legitimately question how well even seasoned PWOs do at this. If, with their experience and training, they still do poorly, how much lower the probability of someone without these benefits becoming an effective manager? Perhaps even a Henry Kissinger would have had a tough time pulling it off when he was twenty-four.

Further, the SCE has additional difficulties. One must remember that he must make PWO-type decisions. But where once there was a captain or so as PWO and an armada of other officers and staff to evaluate decision alternatives, there may now be an ensign or a lieutenant (junior grade) (LTJG) who can bounce his ideas off his clerk-typist. In this environment and without seasoning, poor decisions are not preordained—rather, the probability of them simply increases.

The job can be an exciting and rewarding one, but the author questions if we are properly serving either our customers or our junior officers by detailing to SCE billets, officers on their first or second CEC tour and without public works experience.

A second major problem with the billet is the hazy guidelines controlling it. The OPNAV notice referred to earlier was published in 1969. Further, as a notice, it expired shortly thereafter. Use that as a source of official guidance, and you may find yourself laughed off the court. Other than that piece of paper, there has been a vacuum of official guidance on the subject. NAVFAC says little about the billet, and many PWCs have formalized its responsibilities with internal instructions. Unfortunately, the chaps who walk around with stars on their sleeves, the fellows who will be the SCE's senior in command, are not terribly inclined to listen to directives issued by a Staff Corps.

The result is that the SCE lives in a free-float situation. In the experience of the author, it is a billet which is constantly undergoing reorganization as the incumbent, the CO and the other station power brokers attempt to agree on what piece of the action should go to the staff civil engineer. With frequent personnel turnovers, it becomes an issue never resolved.

Since there is no standard organization, and are no clear-cut responsibilities for the SCE, the author thought it wise to conduct a survey of opinions of those now serving in the billet. We identified 41 such officers and mailed a brief questionnaire to each, centering on his status in the command and his responsibilities. Thirty-five completed forms were returned.

Several responses confirmed this lack of organizational clarity. Said one officer, "SCE duties and responsibilities vary so much from command to command that the title does not identify the job." Adds another, "SCE functions and staffing vary throughout the Naval Complex."

Possibly the most interesting result of the questionnaire was finding that most SCEs feel very good about their job. The vast majority consider themselves to be the "PWO" for their activity, responsible for managing all facility matters. To quote an ensign serving at a major activity in the Pacific, "I am enjoying my tour as SCE both personally and professionally. I feel this billet is an excellent opportunity to learn all aspects of the PWC organization."

A couple of disturbing items, however, do appear. Only 77% of the staff civil engineers prepare the public works budget for their activity. Only 83% have the authority to commit budget resources in operations and maintenance (O&M) of real property (facilities and real estate). Of particular note, only 60% report directly to the CO/XO, and office staffing varies from 0 to over 40! It seems that at commands which believe in a conventional rank structure, our friendly SCE, who is normally rather junior, frequently finds himself buried well down in the chain of command with only limited authority and undefined staff.

Possibly a LTJG attached to a naval hospital best

(Continued on page 22)

When a community's plans tend to disagree with the Navy's...

By LT JOHN G. SIMS, CEC, USN
Assistant To The Deputy Commander For Planning NAVFAC HQ

• Alexandria, Va.

Navy and Marine Corps shore installations were once surrounded by stout attitudinal fences that firmly separated what "we" did inside the fence from what "they" did on the outside. Those were nearly impenetrable fences, built of a desire to remain somehow apart from the concerns of our civilian neighbors.

Changes in public attitudes open much of what we do to public scrutiny. It is no longer simply a matter of "us" on the inside and "them" on the outside. Cities have now grown to surround once remote military activities. Their citizens are vitally interested in the effects of the bases on their pocketbooks, and further demand answers to questions we formerly ignored. Legislation such as the National Environmental Policy Act of 1969 has forced a closer look at federal actions that may influence the environment.

We can no longer afford to isolate ourselves from the community. For many intents and purposes, *the fence is no longer there.* Faced with often conflicting aims in the community, the only real choice available to commanding officers is to work with local and regional leaders and attempt to solve problems in mutually agreeable ways. Refusal to cooperate with representatives of local communities is unwise, actually detrimental, to the continued mission of the activity.

If you doubt the potential for mission degradation, ask the naval air stations that are closed or severely restricted in their operations because of local community pressure against aircraft noise. Ask the activities whose real estate is being sought for return to the private sector. Or ask the public works officers who face restrictions in the availability of utilities.

What are the implications of the Navy/community relationship on questions of local planning, land use and development patterns? How can we best approach our new role as representatives of the Navy in the community? Let's look at some of the answers—answers just now beginning to emerge.

Working closely with our counterparts in the local community can provide paybacks far exceeding the investment of time and energy. Faced with limited resources, we can ill afford to solve problems by throwing money at them. Local governments have inherent powers that can serve our purposes as well as theirs—powers such as zoning, subdivision regulation, building codes, review and approval powers, and perhaps most of all, the power to persuade local citizens.

In working with communities, it is first necessary to locate the decision centers—the people who determine or are responsible for the decisions that can affect your base. The search should not stop with the "wiring diagram" of the local government. Often the real power is within the economic sector, outside the governmental body. Nor should it stop with the closest government. In the New York area, there are over 1400 governmental entities; in some areas of Los Angeles, the governmental overlap is ten layers deep.

Find out *who* makes things happen in the community, and concentrate your efforts on them.

Where vital community issues of growth and economic development are involved, the general public will probably be made up of numerous smaller "publics," each with its own position. In most cases, the Navy will be on safe ground in the local community if it considers itself as one of these publics—albeit a unique one.

The very nature of public discussion of critical local issues sets up adversary relationships which involve the Navy where our interests are affected.

As issues are discussed in the public forum, various groups involved will often align with divergent points of view. Some will coincide with the aims of the Navy; others will be in conflict.

Such situations are to be expected. Keep in mind that local decisions may be driven by economics. The stakes can be high, with strongly expressed opinions on both sides of the question.

The AICUZ Program provides some hard-learned lessons in how to operate in such conflict situations. Let's look at some of the more important lessons—ones that have proven valuable in the past.

Have a plan of action—Establish specific goals to work toward. A new zoning ordinance? Community support for a mission change? Once these goals are established, generate an element-by-element, time-phased action plan for reaching them. Keep in mind, too, that the goals may be unattainable. A complete action plan should therefore contain a fallback position.

Keep politically neutral—Where different positions are involved in the resolution of a public issue, certain parties or groups of people will align with specific positions. Align with a position, but don't orient yourself politically. Alignment with a group or party gives the impression of support for other inappropriate positions. Cooperate with all groups, champion the

. . . play it cool!

position that reflects the best interests of the U. S. Navy, but remain politically neutral.

Communicate—The chances of success are much greater if everyone understands what the Navy is trying to do. Let the community know how they can help. Work *with* the press. Explain the Navy position to anyone that will listen. And keep the chain of command informed of every important event and decision point. Often those in the chain can offer the benefit of lessons learned in similar situations at other activities.

Know the opposition—When conflicts arise involving an issue of interest to the Navy, not everyone will be an ally. Those in opposition to the Navy position may be influential. Often their identity is not immediately apparent. To represent the Navy adequately, you should identify all participants in the conflict and have some idea of their interests. In doing so, be realistic about the motives you may find. The Navy's motives should be readily apparent and above reproach. Those of other participants may result from an economic stake in the outcome, rather than loftier motives expressed.

Retain control—Your involvement in the dispute must remain on a professional level. You will be *personally* involved as a representative of the U.S. Navy but must resist the temptation to become *emotionally* involved. In the face of an attempt to force ill-considered answers, keep cool and reply as a responsible professional.

Be honest and frank—In representing the Navy, accuracy is of the utmost importance. Use complete and honest supporting data, including graphics. Document every point. Over or understatement may first appear to strengthen the Navy's position, but the temporary gains are simply not worth the long-term costs.

Keep on top of what's going on—Communities will grow, if for no other reason than that the Navy is a growth generator. If the Navy expects to have any influence on the pattern of development, we must stay on top of what's going on. That means careful monitoring of the press, rezoning applications, subdivision plats, capital improvement plans, public hearings, and anything else that reflects the pulse of the community.

Be aware of what you have to offer—Chances are, your activity is a big segment of the local economy, and its closure would deal the community a severe blow. Let them know what the Navy means to the community. And take credit for everything the Navy does for community benefit.

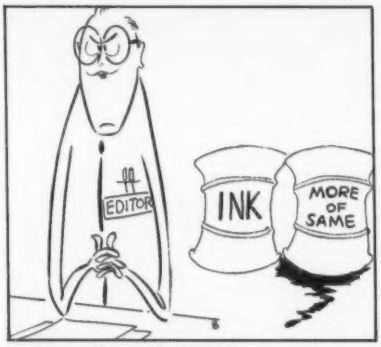
Give it time—Don't rush a resolution of the conflict and jeopardize all of your past efforts. Follow the situation closely and learn to read the signs of impending trouble, but allow solutions to come at their own pace.

Avoid the "We were here first" argument—This old line just doesn't work anymore!

Don't alienate the media—A former commanding officer has said, "You don't argue with people who buy ink by the barrel." Local media support for the Navy can be invaluable in making your position known to the community. Use the press positively, by providing appropriate information at every opportunity. If the Navy is at odds with the local press, you have lost a prime forum for winning supporters. And above all, don't try to argue *with* the press, *in* the press.

. . . But does it work?— Are there any success stories about Navy/community interaction? You bet there are! NAS Patuxent River and St. Marys County, Md., have a local zoning ordinance to protect their airfields from encroachment. NAS Willow Grove, Pa., is successfully opposing a sewer interceptor that would generate incompatible development. Base after base has discovered—or rediscovered—an ally in the local community.

Yes, success is possible. But no one will ever be able to lean back and say, "It's over! We succeeded!" We may prevail on individual issues, but the larger give and take of community interaction will go on as long as there is a base and a community with which to work.



Remember who buys ink by the barrel . . .

Really get involved, but not emotionally . . .

Stay on top of what's going on . . .

An anatomy of a master plan

THE SITE: The Marine Corps' Henderson Hall, Arlington, Va.

By JACK DIRKS
R.A., D.C.
Planner
Chesapeake Division, NAVFAC

• Washington, D.C.

In March 1976, a study was undertaken of the physical condition of buildings and utilities at the Henderson Hall complex, a Marine Corps support installation located in Arlington, Va.

The study described the property with problems of varying structure severity. Particularly noteworthy were:

- dampness and severe rotting of framing members due to water intrusion in wooden buildings;
- water leakage in metal buildings and signs of spot rusting;
- electrical systems in need of replacement; and
- high energy loss due to lack of storm windows and doors, wall insulation and controls for steam heating units.

Three alternatives surfaced as possible solutions for correcting these deficiencies: basic rehabilitation; full rehabilitation; and demolition and new construction. Basic rehabilitation would provide for structural integrity and waterproofing, basic energy conservation measures, and correction of life safety problems. Full rehabilitation would include all basic rehabilitation items plus central air conditioning, improved lighting, and cosmetic upgrading. Demolition and new construction would involve razing and completely rebuilding the installation — in short, Marine Corps urban renewal. The Marine Corps selected the latter as the alternative to be pursued.

During the decision-making process, the Department of Defense was urging the Marine Corps to develop a barracks and messing project for the 1978 fiscal year. However, the time required for project development would not permit submission for FY 1978. Consequently, the development of a barracks and messing facility project for the FY 1979 program became paramount.

Because of the high level interest in the redevelopment of Henderson Hall, the Marine Corps requested Chesapeake Division to initiate a master plan for the Arlington installation.

The master plan schedule provided that the Project Engineering Documentation (PED) for the barracks and messing facility be submitted for inclusion in the FY79 Program by 15 July 1977. Because of the short period a much more detailed analysis of the barracks and dining facility was required than would normally be called for within a planning context. The siting of the FY79 Project had to be thorough as there was not time for restudy.

Complicating the siting analysis was a number of overriding restrictions involving Department of Defense (DOD) and Marine Corps policies as well as physical limitations. DOD had promulgated a plan for the National Capital Region in July 1971, which set long-range real estate utilization policy for DOD properties and leased-space locations within the region. A number of properties was designated for eventual turnover for other uses, including the Henderson Hall and the Arlington Annex sites. A major element of that plan was to be the construction of new administrative facilities at other locations. Relocation to the new facilities was considered the key for discontinuing the use of Henderson Hall and Arlington Annex which were not designated as long-range sites. However, the new administrative locations have failed to materialize and current needs require rapid resolution.

The Marine Corps felt that headquarters support functions should remain as close as possible to the Pentagon. This implied a continued presence in the Arlington Annex building for Headquarters, Marine Corps administrative activities. It also indicated a desire for continued use of the Henderson Hall site because of its proximity to Arlington Annex and the close operating relationship of the two support functions.

The overriding policy restraint, however, was that of the National Capital Planning Commission (NCPC). As the agency having review/approval authority for the planning of Federal properties in the National Capital Region, NCPC played a significant role in determining the future of Henderson Hall.

Having endorsed the July 1971 DOD/NCR plan, NCPC was on record as favoring the termination of military use of both Henderson Hall and Arlington Annex. In doing so, however, the Commission stated that these properties should remain in federal ownership to protect the environmental and aesthetic integrity of the contiguous Arlington National Cemetery. The commission felt that appropriate long-term use of the properties could be used as an extension of the National Cemetery or a monument site. Fore-

most of the commission recommendations was the demolition of Arlington Annex, a warehouse structure now used for administrative spaces and aesthetically not compatible with its surroundings. The Commission staff, however, was fully committed to federal ownership of the Arlington Annex and Henderson Hall sites and would not object to continued Navy-Marine Corps ownership and use of these sites.

With possible redevelopment of Henderson Hall, the NCPC staff indicated that the visual impact upon the national cemetery must be minimal and suggested an undeveloped 200-foot buffer strip between the areas. Building roof lines were recommended to be kept below the tree line, about three to four stories above grade.

Arlington County officials indicated no strong objection to proposals for continued Marine Corps use of the property, provided that the population of the installation did not exceed 1,400 persons, within the planned limits of the county sewage system.

The county also indicated a continuing desire for the eventual extension of Southgate Road through Henderson Hall properties to an interchange at Washington Boulevard. This desire had recently been reaffirmed by the Board of Supervisors in review of the county master thoroughfare plan.

Interwoven with these influences was a Department of Defense directive to take into account the joint-use potential of existing and planned facilities at Fort Myer, an adjacent Army installation. It was further expressed that overall physical planning should provide ready access to pedestrian and bike trails and that no physical barrier be established between the two installations.

The physical limitations of the site consisted of a flood prone area, encompassing more than four acres, and two sewer easements traversing the site. These constraints, when superimposed on the site, delineated the areas where development could take place.

The next planning step was applying the Marine Corps requirements to the site which included approximately 350,000 sf of building area and parking space for 1,054 cars. The parking requirement became an additional problem due to the site location and the shortage of land for development.

The FY79 project proposed a 258-room bachelor's enlisted quarters (BEQ) for 542 persons, a 6,100 sf messing facility, a small armory and an underground parking structure to accommodate 400 cars. The balance of the plan would include an administrative complex and additional parking for 650 cars, with 500 spaces to be underground. The administrative complex evolved from the Marine Corps desire to consolidate administrative functions scattered throughout the National Capital Region at the Henderson Hall site.

Effort was focused on the siting of the FY79 project since it was to go into PED development concurrently with the start of master planning. Of concern was that the site could accommodate the BEQ and messing facility and ready access to subterranean parking.

The master plan and initial PED concepts were first presented to the Marine Corps for concurrence, and then to the deputy assistant secretary of defense (installations and housing). The concept plan was accepted and instructions issued to proceed with the BEQ proposal. The DOD official accepted the Arlington Annex as a long range site for development and conveyed this policy to the National Capital Planning Commission and other appropriate planning officials.

The plan was next presented to Arlington County officials through the auspices of the National Capital Planning Commission. County officials, as previously expressed, were concerned only with the Southgate Road right-of-way and the extension of the road through the Henderson Hall property.

However, the Chesapeake Division real estate director had completed a records search and determined that the county did not possess right-of-way through the site. This determination clarified the status of the site and removed a potential problem.

Concluding the approval process was a briefing of the Commandant, USMC and the NCPC.

The master plan was reviewed and favorably received. The PED had been completed and forwarded to the Naval Facilities Engineering Command for final documentation.

Then energy economics arrived on the scene. It came, not as an equal partner, but as an overriding priority. New instructions called for energy efficient structures innovating the use of solar panels.

If the project had been located in the expansive and sunny climes of the Marine Corps Base, Camp Pendleton, Calif., the solar modifications would have caused little concern. However, Henderson Hall offered little flexibility.

Energy economics was not a newcomer to the Henderson Hall planning process. It had been carefully studied by the design division in structure development.

However, north-south solar panels would be required and building orientation upon the site could play havoc with the existing master plan. If one structure is most efficient in a north-south orientation, should not all the structures be oriented north-south? Another difficulty would be the height of the buildings. To accommodate solar panels and maintain a tree line profile, one floor would be eliminated and space transferred to remaining floors resulting in greater ground area coverage compounding an already tight site.

The major question became then, how should new energy requirements relate to Henderson Hall? Should it be considered an overriding factor or equal to the other problems encountered and subject to certain compromises?

A planner must be equipped to recognize all problem areas, initiate engineering evaluation, determine possible alternatives, and finally recommend the most effective, efficient and economic solution.

The logical conclusion was to consider the energy problems posed as important but not dominant factors in completing the Henderson Hall master plan. Revisions may be adopted to include certain energy conservation techniques but not if they prove a detriment to other problem solutions.

And that, is what master planning is all about.

Post Occupancy Studies

BY GEORGE E. BAER
Interior Designer

• Alexandria, Va.

Criteria, without effective feedback, risks becoming a part of the past rather then providing fresh direction for future design. Yet, feedback is often the most neglected and underestimated part of an acquisition system.

How well do our designs serve the needs of the user? Do our specifications deliver the quality we intended? Is our construction quality adequate? Are we building future maintenance problems into the product? Questions like these must be asked continuously to keep criteria current and relevant.

NAVFAC's Post-Occupancy Evaluation Program was established in 1975 to ask these questions and provide answers. The program takes a look at the results of the total acquisition process. It evaluates the design and construction of facilities and their maintainability. In design, we are looking at functional and design adequacy — trying to determine how well the structure suits the user's needs. In short — how well it works.

We also want to identify construction deficiencies so warranty items can be corrected by the contractor while still in the guarantee period, and so we can measure the effectiveness of the construction engineering system. Finally, we are searching for high-cost maintenance problems so future projects won't include items that will be a burden in years to come. The objectives are to pinpoint problem areas and improve them, and to discover things that work well and repeat them where we can.

The program looks at nine facility types: medical facilities, family housing, piers, enlisted dining facilities, aircraft maintenance facilities, bachelor enlisted quarters, training facilities, operational buildings, and ships maintenance facilities.

Some, like medical facilities, were selected because they occurred often in upcoming Navy construction programs. Others, like enlisted dining facilities and bachelor enlisted quarters, were selected because of a high incidence of problems associated with these facilities. Together, the nine represent an interesting mix.

Evaluation teams are headed by permanent team leaders from NAVFAC Headquarters design staff. The leaders provide continuity throughout the program, have responsibility for follow-up, and are readily available as "resident experts" on their facility categories. The teams include all of the major engineering and design disciplines (architecture, mechanical, civil, interior design, fire protection, etc.) and a representative of the ROICC. They include people from headquarters, EFD, and from the sponsor. Design, construction, housing and maintenance personnel are active and invaluable participants. Except for the leaders, the team members usually change from site to site.

Evaluations break down into three basic parts: pre-evaluation procedures; on-site evaluation; and post-evaluation actions.

In the first phase, facilities to be evaluated are selected by EFDs and assigned to the appropriate team leader. The leader reviews plans, specifications and other data to determine the disciplines needed to evaluate the project. The team is formed and arrangements made with the activity. The EFD is intimately involved in these advance preparations and coordinates all local arrangements.

Upon arrival, the first order of business is a team meeting. This is the first time the team meets to begin a process that lasts, on the average, two to three days. Procedures and schedules are ironed out and initial questions settled. This meeting is particularly important in assuring first-time members get off on the right foot and are productive from the start. The team then meets with activity personnel to brief them on objectives and on the evaluation process. At this session, the activity is assured the team's mission is to audit NAVFAC's acquisition process; *not* their management and operation of the facility. Input from the activity is solicited. Their support and participation are essential.

After an orientation tour, the team breaks up for a detailed review and interviews with management and users. This continues throughout the inspection. The team checks the facility from top to bottom. Everything is studied from food service to furniture. Each day, the team assembles to iron out conflicts, eliminate overlaps between disciplines, and discuss findings. Upon completion, the informal results are presented to activity personnel in an exit briefing.

The last phase involves coordination of findings with all the individuals and organizations involved, preparation of a formal report by the team leader, and follow-up. Quarterly status reports are prepared, and a final report submitted outlining all actions taken as a result of the evaluation. In addition, a "lessons learned" synopsis is prepared to disseminate evaluation results to NAVFAC field activities for use in current and future projects.

Eighteen projects have been reviewed to date with a total of 25 scheduled to complete the study.

The program is paying off in terms of its original goals. Benefits can be summarized as follows: criteria are being developed on a preventive maintenance basis rather than as a crash response to urgent problems; headquarters and EFD

personnel are getting out in the field for face-to-face, hands-on experience with our facilities and their users; headquarters personnel are getting a better understanding of problems at the grassroots level; more accurate and more responsive criteria are being developed for future projects; post-occupancy statistics are on the way to becoming a very valuable tool to identify problem areas for management attention.

In short, facility post-occupancy is alive and well at NAVFAC!

SUMMARY OF POST-OCCUPANCY EVALUATION

Facility Type	Evaluated To Date	Planned Evaluations By End of Study
Medical Facilities	3	4
Family Housing	2	3
Piers	3	3
Dining Facilities	2	3
Aircraft Maintenance Facilities	2	3
BEQs	2	3
Training Facilities	2	3
Operational Buildings	1	1
Ships Maintenance	1	2
Totals	18	25

Economic Analysis Of Overseas Family Housing

By JAMES J. CARBERRY
Operations Research Analyst
Systems Analysis Division
NAVFAC HQ
• Alexandria, Va.

Economic analysis is a dynamic factor in facilities planning. A recent case in point is the provision of housing for military personnel in the London, England area, where the application of economic modeling techniques led to the removal of a legal obstacle.

The economics of the leasing situation in foreign areas are such that private leasing by military personnel, especially enlisted, is difficult, and lease-construction of family housing is nearly impossible.

In the United Kingdom, landlords have raised rents above the level that American military personnel can afford.

Concurrently, U. S. legislation has been imposed on foreign leasing. Public laws limit the monthly rent (including utilities) that may be paid for foreign family housing and has limited overseas leases to five years. In addition, overseas construction projects are very difficult to program.

Recognizing a serious situation, the Assistant Commander for Family Housing requested the systems analysis division to assist in finding the most economic solution to the problem.

Using a general mathematical model, an economic analysis was performed for a 200-unit family housing project located at West Ruislip in Greater London. The model, using the method of "discounted cash flows," allows calculation of the yearly rent expense that the U.S. Government would expect to incur for a given lease-construction project. From this yearly rental expense, life cycle costs are calculated.

The model assumes the perspective of an entrepreneur in order to develop the amount that he must charge to achieve an adequate rate of return on invested capital. Model parameters include the proportions of equity and borrowed capital invested in the project, interest rates, corporate tax rates, the long-range inflation rate, required rate of return, and the international monetary exchange factor.

If the appropriate parameters are known, the model can be applied to any lease-construction project. To enable rapid evaluation of varying parameters, a FORTRAN computer program of the model was written.

The results obtained showed that, within the legislation, lease-construction of family housing in the London area was economically impossible. A key factor is that foreign lending policies require that construction loans for lease-construct type projects be repaid in full within the initial lease contract period. Under these circumstances, the allowable monthly rent is not sufficient to enable the entrepreneur to pay off the loan and realize a profit.

Sensitivity analysis indicated that no parameter affects costs as powerfully as the length of the lease duration. Significantly, a ten year leasing period—a 100% increase in utilization over the five year period—increased the present value of life cycle costs by only about 10%. Furthermore, renewing a five year lease to cover ten years results in a 70% greater life cycle cost than if the lease were originally written for ten years.

As a consequence of these studies, the U. S. Congress was successfully petitioned to change the law to permit ten year leasing in overseas areas. Like a shopper buying the large economy size package, the U. S. Government made a conscious decision to choose the alternative with the lower "unit price."

Preliminary negotiations with entrepreneurs yielded five firm proposals for lease-construction of the 200 units at West Ruislip for a ten year term.

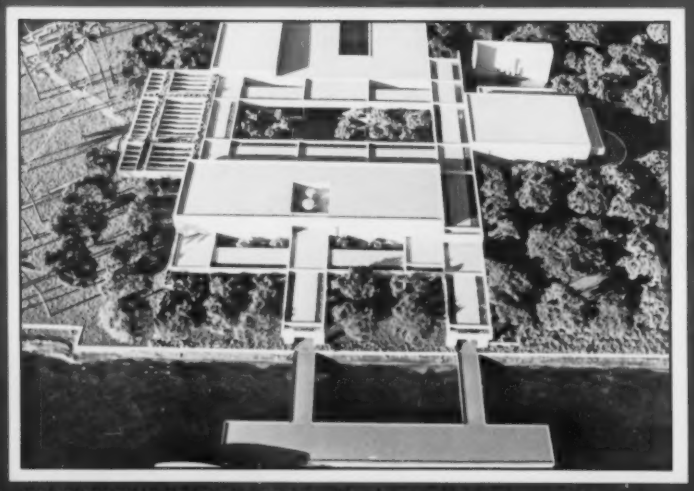
As a result of decisions guided by the West Ruislip economic analysis, lease-construction became practical, but is it the most economical alternative? The answer is yes, for further analysis indicated that, under the terms of the least expensive proposal, lease-construction has lower present value costs than military construction even for housing requirements of up to 30 years.

pages for the NAVFAC/CE

CAST OFF commands LCDR Michael E. Weyler, CEC, USN, *(above)* instructor for underwater construction at the Naval Construction Training Center (NCTC), Port Hueneme, Calif., from the 'bridge' of his 'ship,' as crewmembers (above right) BU2 Robert Polley and EO1 Lindsay Bodwell oblige. Later the NCTC craft (right) is hoisted from the water following its shakedown cruise. The boat was constructed by NCTC from salvage parts and is used to transport construction trainees to their underwater classrooms 300-600 feet off shore. Formerly the trips were made by tugs whose rental costs could run as high as $2,000 per day.

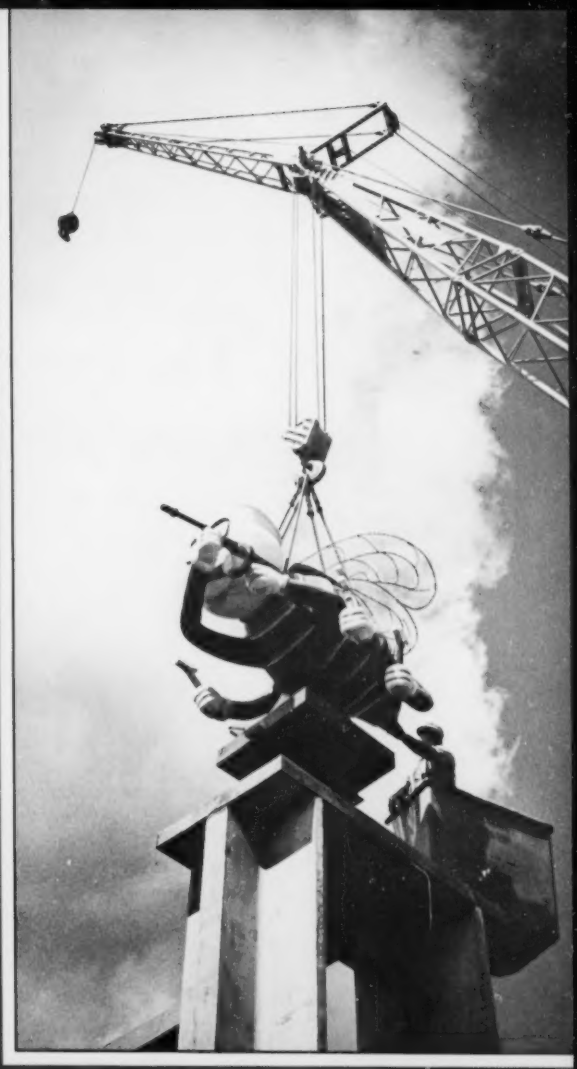
OFF THEY GO into the Navy's civil engineering world, graduates of Naval School, Civil Engineer Corps (CECOS) Class No. 145: *Front row from left* — Ens T. L. Ortel, Ltjg B. D. Tyler, Ens. T. R. Weigand, Ens M. P. Migliore, Ens T. W. Stevens, Jr., Lt O. N. McNeil, Jr., Ens D. K. Lynn, Ltjg P. L. Check, Ens R. V. Klutz, Ens L. G. Serafini, Ens A. S. Weber. *Second row* — Ltjg J. V. O'Connor, Jr., Ens D. P. Aide, Ens G. P. Emsurak, Ens S. E. Barker, Ens P. F. Krug, Ltjg C. G. Pavlos, Ens L. A. Laws, Ens S. B. Hinchman, Ens D. D. Curnutt. *Back row* — Ltjg G. D. Smith, Ens J. D. Grelson, Ens A. S. Griffith, Ltjg B. L. Pierce, Ens D. J. O'Loughlin, Ens C. E. Syversen, Ens L. M. Alexander, Ens M. D. Pfarrar, and Ens E. W. Desaulniers. *Not pictured* — Ltjg W. C. Asmussen, Ens M. J. Booth, and Ens R. D. McClure.

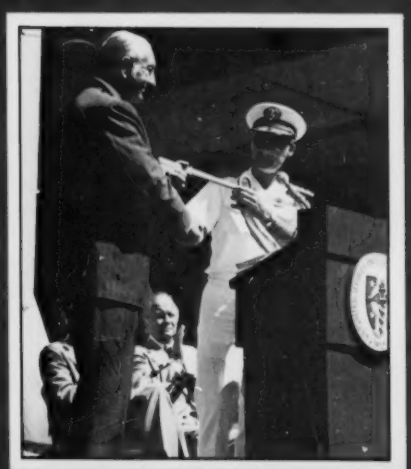
EC/SEABEE family album



REMEMBERING PEARL HARBOR will be the new *U.S.S. Arizona* Memorial Visitor Center *(model above)* which will house a museum, theater and other accommodations for the million visitors who annually visit the site which forced the United States into WWII. Dedication of the structure is scheduled for December 7, 1979, the construction contract will be administered by the Pacific Division, Naval Facilities Engineering Command. *EVEN A SEABEE NEEDS A FACELIFT* as the world-renowned Navy construction-man's symbol is refurbished *(right)* in front of headquarters of the Commander, Construction Battalions, Pacific (COMCBPAC), also located at Pearl Harbor. RADM N. W. Clements, CEC, USN, commands both the Pacific Seabees and the Pacific Division of NAVFAC.

SEABEES OF ANOTHER ERA find Okinawa *(above)* more tranquil than did their WWII predecessors. Members of Naval Mobile Construction Battalion 3 (NMCB-3) are shown loading their heavy equipment for debarkation to the nearby island of Ie Shima, where they restored an impact area of a U.S. Air Force bombing range. *SYMBOLIC KEY (right)* is received by David Packard, chairman, Board of Regents of the Uniformed Services University of the Health Sciences, from RADM Donald G. Iselin, CEC, USN, Commander, Naval Facilities Engineering Command, upon the completion of the first increment of the university's construction at Bethesda, Md. The institution, which will train physicians and surgeons for the U.S. armed forces, is located near the National Naval Medical Center.





Shore Facilities

By ROBERT E. MYERS
Head Operations Branch
NAVFAC HQ.

• Alexandria, Va.

The continued existence of any enterprise, public or private, depends on its initiative to prepare for future events. No endeavor is static. Existence requires growth and process for survival. Problems associated with unplanned growth can be avoided by the timely and orderly development of policies and plans of action. The Navy, no different in this respect than private enterprise, must be able to forecast its requirements and plan for their orderly integration into existing systems. This should be accomplished with least disruption and hopefully maximum benefits. The precise process used by the Navy planners to accomplish this goal in the area of shore facilities development is the Shore Facilities Planning System (SFPS).

In the late 1950s and early 1960s it was recognized that the system of planning for the shore establishment's improvement was in need of strengthening. Traditionally and historically the Navy has consistently well planned sea operations. However, the planning of shore facilities to support such operational endeavors did not always enjoy parallel success. Facility planning in some cases was done only as a last resort and then to justify new construction. For planners, the quality and depth varied from command to command and project to project. Planning also was done with rather a parochial view, without considering the total development of the activity and the full utilization of its assets.

The lack of adequate planning was of such concern that a task force was formed in March 1960 to improve the methods of planning for shore establishment support of the operational forces. The task force was divided into working groups comprised of military and civilians from OPNAV, the major claimants, district commandants, public works organizations and the various bureaus. The efforts of these groups resulted in the publishing in 1960 of OPNAV Instruction 11010.1E which, in effect, was the beginning of the Shore Facilities Planning System.

SFPS hopes to insure that the amount of effort and funds expended for shore facilities are in proper balance with the support requirements generated by Navy operating forces. To determine where, within the shore establishment, the facility dollars can be better spent, especially with today's diminishing construction dollars, the Shore Facilities Planning System represents a planning method that provides to the Navy a uniform and consistent approach to shore facilities planning.

The SFPS insures that every activity of the Navy is involved in the planning process and a method of strong facilities management. Properly done this process should provide the CNO, the major claimants, various naval systems commands and the activity commanding officers a thorough knowledge of their projected needs. This system enables all levels of the Navy to make facility related decisions of providing shore support to the operating forces in a timely and cost effective manner.

Facility planning is of greater importance today with military construction dollars at a premium. Sufficient funds are not available to satisfy all facility needs. While each shore activity, by nature, feels that its own project is perhaps overdue and crucial, those at high Navy levels must have a method of determining which projects, among the total deficiencies of the Navy, represent the biggest payoff. Those who approve the military construction dollars of the Navy must be able to rely on the project data before them during the selection of an annual military construction program. The SFPS provides this data credibility since each project has received the validation process of the SFPS.

Also of concern is the closer review of our military construction programs that the Congress approves every year. We must be certain that any project that goes before a congressional committee is completely justifiable and in the national interest.

The development of accurate facility requirements, thorough analysis of conditions and potential use of assets, and assurance of full utilization of existing assets prior to developing a military construction project require trained professional planners. The various reductions in personnel that the Navy has endured during the past decade has resulted in a shortage of planning personnel. Consequently, the bulk of the planning needs of Naval activities, as they relate to the SFPS, has evolved to the EFDs. While the EFDs have professional planning staffs, they are not able to absorb the total planning needs of their geographic area. However, the need for planning is more crucial today than ever before. Consider the continuing GAO and Navy audits examining our facilities and the dollars spent in support of them; public reaction to DOD spending; interservice competition for facility dollars; inter-Navy competition for MCON dollars, etc. The only answer is that each level must again assume its share of the planning load. The activity, major claimants, Public Works Centers and the like must become totally involved in the development of facilities planning data that provides a credible and reliable input into the decision making process of the Navy, as it relates to facilities and the dollars in support of those facilities.

But what are the roles that should be played by the various organizations in the planning process? Initially each activity and public works organization should have planners, thoroughly knowledgeable in the Shore Facilities Planning System. The ability to generate facility requirements based upon sound engineering

analysis or application of criteria is essential. It is important that the facility requirements not be overstated but rather represent a hard austere approach of properly fulfilling the activity mission.

A thorough analysis of existing assets, while a responsibility of the EFD, should also be of personal interest and concern to the activity planner. The activity can provide an invaluable assist to the EFD during an engineering evaluation of assets, by providing facility information on condition and proposed use based on day to day observations. As in the case of requirements determination, facility condition should be based on a hard honest appraisal.

A major effort that is all too often overlooked is the preparation of the OPNAV 11000/3 Form. This is where the planner really begins to earn his money. With the limited dollars available for facility construction and modification, the planners first responsibility should be to insure full and proper utilization of all existing assets. Ideally, all the requirements of an activity would be satisfied through the full, efficient and proper use of all the existing assets. The requirements should be looked at closely if the function appears to exist adequately in existing space, while at the same time if the requirements exceed the available assets, perhaps the requirement is overstated. Note that the criteria found in NAVFAC P-80 provide a guide as to the maximum allowable and do not necessarily represent the requirement when site adapted to local needs. If it should be determined that there are excesses beyond requirements, a plan of action should be initiated to transfer or reassign the excess space to another activity in need of space. This will insure full utilization of Navy-wide assets. Where there is no alternative to an identified deficiency and additional space is needed, a project can be initiated by the activity by use of the OPNAV 11000/4 Form.

Equally important is the need to establish a credible base of data related to shore facilities of the Navy for decisions at the OPNAV level, such as force relocation, activity consolidation, and non-Navy tenant relocations to a Navy host. For years these types of decisions were made devoid of facility considerations. However, today by way of the SFPS, facility planning information is readily available for use in the high level decisions affecting the Navy shore establishment. It is imperative that this information be accurate.

When Typhoon *Pamela* hit Guam several years ago a massive reconstruction program was necessary to replace the damaged facilities. Projects and their justifications had to be developed within two to three weeks. The project development met the schedule because the Pacific Division had current and complete SFPS data which was readily transferrable to OPNAV Forms 11000/4 and DD Form 1391.

We should not overlook the benefits to be derived from the SFPS even if MILCON dollars are not likely to be realized for a particular activity. As mentioned earlier, the SFPS represents a disciplined approach to facilities management. Full use of the methodology of the SFPS should insure the effective and complete use of all existing assets. Each Naval activity is similar to a small industrial city. Effective management of the facility resources of the "city" can result in cost effective solutions that may negate the need for MILCON dollars. This would also satisfy the facility needs now, rather than wait through the long MILCON cycle.

The originators of the SFPS probably did not anticipate today's competitive environment for construction dollars that places planning of the shore establishment in an ever more important role. However, they did provide the basic framework to enable the Navy to plan its shore facilities in a logical manner. As we approach 1980 and the twentieth year of the Shore Facilities Planning System, the NAVFAC family, headquarters and EFDs are working to insure that the SFPS stays current with a changing Navy.

Steps are underway to streamline our facility planning making them more responsive to the facility needs of the Navy. Integration of the master planning and requirements planning process to provide a total planning picture of the activity is under development. Further enhancements to the automated portion of the SFPS are in process to provide more reliability and flexibility in computer support of planning. Quality assurance programs to improve our data credibility are underway. Training programs have been developed to assist the activity planners. The Shore Facilities Planning manual (NAVFACINST 11010.44C) was recently rewritten to provide the field with the latest procedures of the Shore Facilities Planning System.

Overall, in the future the Navy will become more dependent on properly planned facilities as we make the translation to the CNO announced goal of increasing the fleet to the 600 ship level. This must be accomplished while the Navy experiences an increasingly competitive environment for military construction dollars. With adequate concern for planning at all levels and with trained planners working within the planning process of the Shore Facilities Planning System, we can have confidence that our facility dollars will be placed where they will provide the maximum support to the operational forces of the Navy.

Planning System

Study The Entire Mediterranean

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Project STEM (Study The Entire Mediterranean) originated in 1972, when the Chief of Naval Operations approved a request by the Commander in Chief, U. S. Naval Forces, Europe (CINCUSNAVEUR) for a study of the shore based logistic support requirements of the entire area. The analysis was to be projected into the early 1980s for essential maximum peacetime operating efficiency while being capable of rapid response to contingency situations. The study findings were also to provide a basis and rationale for more detailed studies of specific high interest problem areas or functions. The scope of this undertaking, logically led to the decision to conduct the study on a systems basis. Critical logistics operations and their related facility types were grouped into functionally related systems to be evaluated in terms of their collective ability to suport the operating forces in the study region.

The broad view of the functional relationships of an entire logistics system was a critical first step in determining the adequacy of the facilities available to provide fleet support. Where shortages were identified, the study findings provided both the information and options available for decision in satisfying individual facility deficiencies.

Using a systems approach, the original STEM study identified ten major logistics support categories as separate functional systems: POL (petroleum, oil and lubricants), ammunition ports, aircraft basing, ship and aircraft repair, communications, air logistics, cold iron, dependent support and medical.

After identification of the major systems it was necessary to determine the international and U. S. Navy influences prevailing in the study region and their impact on Naval operations in the area. Among these were the expanding presence of Soviet naval forces throughout the region, the military and financial withdrawal of France from NATO, and the loss of U. S. base rights in Libya. Included among the policy influences affecting operational considerations were the homeporting concept with its expanded requirements for 'cold iron' support. New ships and aircraft, such as the AOE class resupply ships and the C5 aircraft were at that time, coming into the inventory with new and different support requirements, and they too had to be considered. Further the impact of expanding technologies of communications and avionics required new and/or additional maintenance and repair support.

The preceding considerations are by no means all inclusive and are cited only to illustrate the range and complexity of influences requiring that the region be studied as an entity rather than detailed studies of individual bases. The regional planning approach was not intended to replace the concept of individual activity master plans. Rather, they would provide a more valid basis for conducting individual studies by clearly defining both the immediate and long range roles of each of the bases, their support responsibilities to the operating forces and their interrelationships throughout the Mediterranean.

The research phase required intensive data gathering efforts from a wide range of information sources and extensive coordination with the fleet operators and systems commands, plus on-site investigation at the bases in the study area. Liaison was established with the office of the Chief of Naval Operations to determine strategic concepts and long range policy, and to establish base missions and projected loadings. Coordination with the systems commands was required to confirm ship and aircraft operating characteristics, their maintenance and support requirements, and to determine resupply procedures and requirements. Discussions with representatives of CINCUSNAVEUR/ Commander Fleet Air Mediterranean (COMFAIRMED) and the Sixth Fleet provided information on fleet operating procedures and

established responsibilities and commitments for conducting operations in the Mediterranean in contingencies.

After assembling and correlating the data from such a range of sources, the process of analysis and evaluation was undertaken. Utilizing the bases identified as essential to conducting operations, the support responsibilities and facilities required to perform these support functions were quantified and compared to the existing physical assets available at each of the bases considered.

From this process of quantification and analysis, a matrix was developed which documented the mission support capabilities and limitations for each of the major support systems considered. Those facility weaknesses which might constrain support to the operating forces were graphically portrayed. Depending on the base location and the prevailing political influences, it was then possible to determine the best means of satisfying the recognized facility deficiencies.

Because of the broad range of political situations and military agreements in effect, these options could include United States military construction, NATO infrastructure projects, leasing or lease construction. Additionally, the study provided the operational planners with a systematic analysis of functional logistics systems capability at each location and identified existing and projected deficiencies for the system over the entire region. The systems view of facility capabilities and deficiencies provided a rational means by which decisions regarding priority for facility acquisition could be made, or other options identified.

The study conclusions and recommendations developed functional facility deficiencies as a basis for preparation of detailed project documents. Additionally, for each base or complex considered, the aggregate of identified functional deficiencies provided the basis for specific development of facility studies or comprehensive master plans.

When completed and presented to CINCUSNAVEUR in 1973, the study received wide acceptance as a valid guide for coordinated facility development and acquisition to support the Naval operating forces in the Mediterranean. Additionally, the study was recognized by the operational commanders and logistics planners as a comprehensive reference source as it documented the capabilities of each base and location in the area to provide logistics support in each of the systems considered.

In 1976 CINCUSNAVEUR requested Atlantic Division, Naval Facilities Engineering Command (LANTDIV) to undertake a revalidation and update of the original STEM study. This decision resulted from significant events which had occurred in the region since completion of the original study; such as the withdrawal of countries from military participation in NATO, as well as changes in command relationships, fleet size and operational areas. The changes in port and base availability, shifting political alignments in the Eastern Mediterranean and the fact that many of the facility proposals recommended by the original study had since been implemented dictated that the study be updated.

The experience of the original STEM study effort had conclusively shown the systems analysis approach to be the most feasible method to conduct a study of magnitude and complexity. The scope of the study update was expanded to include the Eastern Atlantic operating area recognizing that facility and logistic support in this region is functionally related to the Mediterranean and can therefore directly influence operations in that area.

While the original STEM study was presented as a single volume, the updated study systems were published as single volumes as completed. This method of presentation was chosen not only to accommodate the increased scope of each of the logistics systems but, more importantly, to make the study results for each system available on a continuing basis as completed and to ease future updating efforts.

Experience gained in the original study had shown a need to include more extensive discussion of the operational alternates and more detailed information of facility deficiencies. The study update also focused increased attention on the capability of certain critical systems, such as POL and ammunition, to accommodate surge loadings during the transition from peacetime operations to full wartime logistics systems.

During preparation of the original study certain of the systems considered, such as radio communications, were already aligned under a single manager and could be deleted from further consideration. Other systems, such as dependent support, were excluded from consideration as the facility requirements for this function are directly related to individual locations and provide little opportunity for regional or theater consideration.

The original study also had shown that several of the functional systems were so highly interrelated that their analysis and consideration should be combined for purposes of the contemporary study. Systems lending themselves to this approach included the ports and cold iron systems and the air basing, air logistics and aircraft repair systems.

The proposal to expand the geographic area of study and to combine or delete certain of the study systems was approved by CINCUSNAVEUR in mid-1976 and the study revalidation was initiated by LANTDIV at that time. Since then, three volumes have been completed and provided to CINCUSNAVEUR, COMFAIRMED and Commander in Chief, U. S. Atlantic Fleet (CINCLANTFLT) with the entire effort scheduled for completion in 1978. Subsequent maintenance of the study to ensure currency will be conducted on an 'as required' basis determined by annual review.

Experience in preparing and using STEM has clearly demonstrated the validity of both the regional study concept and the systems analysis approach. The study findings have not only provided a long range guide for future development and a means for identifying and validating facility deficiencies, they have also achieved wide acceptance among operational planners and logisticians as authoritative references describing existing fleet support capabilities in the region.

Staff Civil Engineers

(Continued from page 9)

expresses this problem. In response to our questionnaire, he said, "I work for a lieutenant commander, Medical Service Corps, who works for a captain, Medical Service Corps, who works for the CO/XO. Further, we have a GS-12 hospital engineer who supervises a work center of six PWC maintenance men. I have no line relationship with the engineer at all."

Though not disastrous, I would suggest that if the same percentages applied to PWOs, we would be witness to much discontent in their ranks.

Face it, seniority is part of the game. We play it, too, rigidly at times. Unfortunately, sometimes it is not appropriate. For better or worse, most bases spend the major portion of their O&M dollars on public works functions. Whether it's a lieutenant staff civil engineer or a captain PWO managing that function, the importance of doing it well does not change. The one who manages it should be organizationally close to the commanding officer.

Confusing rank with billet importance has long created problems for other public works managers. The PWO, for example, is normally relatively junior, making it sometimes more difficult for him to do business. Replace him with one far more junior, and the problem is aggravated. Remove policy guidance on how that individual fits into the organization and eliminate his staff, and matters can further deteriorate.

To digress briefly: The SCE normally has additional duty as an Activity Civil Engineer (ACE), a PWC billet. ACEs are normally responsible for serving as a facility management consultant for the PWC customer and acting as his advocate within the Center. Several SCEs commented that assignment to this second job was unwise as it forced them to try serving two masters: their command and the PWC. They recommended they not have ACE responsibilities.

Frankly, I disagree. The situation may not be ideal, but with our limited corps strength, it's doubtful if there will ever be enough officers to assign ACEs to assist commands which have SCEs. Thus, if the SCE wants to be able to delve into the innards of the center to find and push the right buttons to make good things happen for his command, he must be a part of the PWC organization. If he is not, he loses this access and must rely on command to command stuff every time he's got a problem with the PWC.

It's appropriate to point out here that the PWC succeeds only when it is satisfying its customer, thus the objectives of the SCE and the center are mutual. An adversary relationship simply shouldn't exist.

Unfortunately, reality often does not mirror theory. Real world problems can and do arise which can place the SCE in touchy situations, but it's doubtful that getting rid of his ACE hat would help him. It may even compound his troubles. Face it, it's not career enhancing to publicly throw mud at the Corps regardless of your chain of command. Cool will remain necessary.

To recap, I see two significant problems in the SCE billet:

- Detailing of inexperienced officers into a billet which parallels that of a PWO at a major installation.
- Lack of OPNAV guidance on the functions and responsibilities of the staff civil engineer, meaning one must depend on the luck of the draw rather than on an institutionalized organizational structure.

What to do? I would propose that there are three alternatives:

- Eliminate the billet and do it all with the ACE.
- Do nothing. Even the President admits life is unfair.
- Improve, at least incrementally, the problems discussed.

It's difficult to see any benefits in the first alternative. For one thing, it would further decrease the facility expertise at activities served by PWCs—hardly a way to improve our management of limited resources. It would also make the commanding officer more suspect of the PWC as a somewhat alien organization. Importantly, from a professional standpoint, the billet of SCE is normally considered a good one, and the ACE job is thought of as less desirable. Let's call this one the "Liberty is canceled until morale improves" alternative.

If we accept that the billet has some probelms, it is difficult to accept the second alternative. Yet it seems to be precisely the one we are pursuing. Junior officers have been squawking about the problems of the SCE for several years, but are still awaiting recognition. Possibly it's because the billet didn't exist at the activity level when our seniors were lieutenants, so they don't really empathize with the problem. Possibly they wish to avoid holy war with the line Navy. We, however, pride ourselves as managers. Here is a problem (opportunity?) which may have a manageable solution. We would be remiss not to pursue it.

This leaves alternative three. But talk is cheap. What specifically might anyone do to alleviate the situations? Here are a few ideas—

First, NAVFAC should establish firm guidelines for assignment of officers to the staff civil engineer billet. A recommendation is that any officer going to the billet should have minimum of 18 months public works experience or four years service in the CEC. Further, we would advise that the billet be filled by a lieutenant or above. (It may be appropriate to note here that these billets exist only at major activities. Smaller ones will not have an SCE but will rather receive assistance from an ACE.)

What about consequences? A more senior rank structure in the SCE business means a more junior rank structure elsewhere. To avoid controversy, we would suggest that there are opportunities within the public works business. It's interesting to note, for example, that a so-called "Module II" PWD rates three officers: a commander for PWO, a lieutenant commander as his assistant, and an ensign for planning. Should that activity be consolidated into a center, we would expect that the SCE would be at best a lieutenant, even though the responsibility for management of base facilities has changed very little. Further, without his own work force, he can no longer flex his muscles and get action. Now he must work with, needle, cajole, and threaten a separate organization, the PWC, to get even the smallest task accomplished.

It would seem reasonable to assign the lieutenant to the APWO billet and reserve the more experienced lieutenant commander for an SCE job. We meant it earlier, when we referred to the high level of talent in junior officer ranks. Giving these fellows the opportunity to exercise this talent, under the guidance of an experienced mentor, would certainly be a super opportunity for them to learn a fascinating business.

To keep our arguments in perspective, let's review what the rules say about these issues. Our oft referred to OPNAVNOTE 5450 (16 October 1969) says all SCEs should be a lieutenant or above. There is no allowance for more junior officers to serve in the billet.

Another interesting point: The CEC's Zero Base Study specifically states that no officer shall be assigned as staff civil engineer without prior public works experience.

The point is without a powerful advocate these grand statements were apparently overlooked in the competition for CEC talent and experience. A quick review of our questionnaires reveals that one-third of the SCE billets are filled by LTJGs and below. Further, a substantial number of the lieutenant staff civil engineers lack facility experience.

It is believed that the suggestion provides a realistic basis for improving the qualifications of the staff civil engineer. They're no more severe than those directed by OPNAV. They would certainly affect the rank structure of our Corps, but then there are good things and bad things about everything. In this case the good things about the ideas outweigh the bad.

Regarding our second concern, lack of official guidance on the role of the staff civil engineer, clearly the billet should be institutionalized. First, this will entail putting out a piece of paper—an OPNAV instruction, a change to Navy Regs—whatever. That's not our concern. Rather our concern is that an official document with the imprimatur of the CNO describe in some detail *who* the staff civil engineer is and *what* he is supposed to be doing for the command and *where* he belongs in the organization. This should be followed by something from NAVFAC outlining staffing standards.

This, however, will not be enough. We should keep our ears a little closer to the rail and remain more aware of what's happening at those activities with an SCE. Further, NAVFAC must be ready to go to general quarters if OPNAV guidance is flaunted and an SCE is relegated to an inappropriate role in an organization. All this may sound difficult, but it's no more than we should expect would happen if a CO started using his administrative officer as PWO and using his PWO as assistant airfield operations officer.

This is the real crunch. Are we willing to go to the mat over a LTJG?

We do not have enough officers to be all things to all people. If a CO elects to misuse the CEC talent made available to him, we should exercise the option of not staffing the billet and use that officer elsewhere in the Navy where his contributions will be more welcome.

The average SCE is quite aware of the current lack of policy concerning his billet. However, most have finessed themselves into a good billet. Others have not.

It's time to care about them.

A. C. HUSBAND
Rear Admiral, CEC, USN (Ret)
1914-1978

Rear Admiral Alexander C. Husband, CEC, USN (Ret.) former Chief of Navy Civil Engineers and Commander, Naval Facilities Engineering Command died suddenly on January 23 in Middlesex Memorial Hospital, Middletown, CT. Death was attributed to a heart attack.

Born in Troy, New York on March 27, 1914, Admiral Husband graduated from the United States Naval Academy in 1935. He earned a master's degree in civil engineering from Rensselaer Polytechnic Institute in 1940 and received an honorary degree of Doctor of Engineering from that same institution in 1967. He was also a graduate of the Harvard Business School advance management program.

In 1964, he was designated Deputy Chief of the Bureau of Yards and Docks and Deputy Chief of Naval Civil Engineers. He was appointed Chief of the Bureau and the Corps by the President effective November 1, 1965 and on May 1, 1966 became Commander, Naval Facilities Engineering Command (formerly Bureau of Yards and Docks) as a result of a Navy Department reorganization.

Following 34 years of naval service Admiral Husband retired from active duty in 1969 to become vice president for construction with the Consolidated Edison Company of New York. In January 1972 he became an Associate with Fenton G. Keyes Associates, a Providence, Rhode Island consulting architect-engineering firm, and specialized in waterfront construction projects.

Admiral Husband is survived by his wife, the former Mary Hodges Bacon of Old Saybrook, Connecticut.

Interment with full military honors was held in Arlington National Cemetery January 27, 1978.

R. H. MEADE
Rear Admiral, CEC, USN (Ret)
1905-1977

Rear Admiral Robert H. Meade, CEC, USN (Ret.), Chief of the Bureau of Yards and Docks and Chief of Civil Engineers from October 1955 to December 1957, died on December 23, 1977.

Admiral Meade was a graduate of the U.S. Naval Academy, class of 1926, and Rensselaer Polytechnic Institute.

Upon his retirement from the Navy he worked as a consulting engineer for the State of New York and later served as chief administrative officer, senior vice president and partner for the New York engineer/architect/planning firm of Parson, Brinckerhoff, Quade & Douglas.

Interment, with full military honors, was held in Arlington National Cemetery on January 5.

Rear Admiral Meade is survived by his wife, Dorothy; daughter, Temple; and sons, Robert and William.

Naval Facilities Engineering Command
SITUATION REPORT

ACQUISITION OF FUEL-EFFICIENT PASSENGER AUTOMOBILES - Title V of the Motor Vehicle Information and Cost Savings Act, as amended (15 USC 2010), and Executive Order 12003, July 20, 1977, requires that all automobiles acquired, whether by purchase or lease (over 60 days), by executive agencies, must achieve a fleet average fuel economy of not less than 20 mpg in FY 1978 and 22 mpg in FY 1979. In subsequent years the fleet average fuel economy must exceed the statutory minimum requirements established in the Act by at least four miles per gallon. To comply with the statutory requirement of 20 mpg in FY 1978, a significant number of sub-compact sedans will be procured for Navy use. Subsequent procurements of small and sub-compact sedans can be expected which will be used as replacements for the intermediate and regular size sedans and station wagons as they become eligible for replacement.

(NAVFAC Code 103)

CLEAN AIR ACT AMENDMENTS (PL 95-95, 7 AUGUST 1977) - The principle of Federal sovereignty has traditionally excluded Federal agencies from state and local procedural requirements. The new Clean Air Act Amendments of 1977 (PL 95-95) remove this exemption with respect to the control and abatement of air pollution. Commanding Officers of naval activities (as well as all other agents and employees) must now assure compliance with all applicable state and local requirements, whether administrative or substantive, including any record keeping or reporting, and any requirement with respect to permits. Legal actions against activities operating non-complying sources can be expected. Additional information regarding the Clean Air Act Amendments may be obtained through the Environmental Information Coordinator at the Navy Environmental Support Office (Autovon 360-4182 or Commercial 805-982-4182).

AMENDMENTS TO FEDERAL WATER POLLUTION CONTROL ACT (FWPCA) - The House and Senate has passed the long-awaited amendments to the FWPCA on the final day before adjournment. Following in the footsteps of the Clean Air Act, the FWPCA amendments require federal facilities to comply with <u>all</u> procedural <u>and</u> substantive State and local requirements. This would include any record keeping, reporting, permits and/or fees. A synopsis of the bill will be forthcoming through the Naval Environmental Protection Support Service.

(NAVFAC Code 104)

Facility Assets Data

NAVY & MARINE CORPS

REPORTING ACTIVITIES
734

PROPERTY RECORDS
182,871

CURRENT PLANT VALUE
$53.0 BILLION

By **BARBARA BOSLEGO**
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The Navy and Marine Corps control nearly as much land contained within the state of New Jersey. And this real estate contains 110,000 buildings with 662,640,000 sf of floor area. Totalling land, structures and utilities, the Navy and Marine Corps control 183,000 items of real property whose estimated value is $53 billion. This is near the dollar value of the combined total assets of Exxon and General Motors, the two largest industrial corporations in the U.S., which is reported at $60.7 billion.

The Navy Department is required by public laws to record and maintain specific financial and physical data on Naval facilities. The information is valuable for many uses. A shore activity commanding officer obviously needs to have information on the facilities that are under his control and asset data is a factor in distributing maintenance funds to the major claimants. The Shore Facility Planning System requires up-to-date information to determine deficiencies, for which construction must be planned, and excesses which are available for transfer, reassignment, or demolition. The Chief of Naval Operations and the Secretary of Defense use assets data for mission assignment and base realignment. Congressmen are concerned about the size and value of defense installations within their constituencies and often request assets data from the Department of the Navy.

To satisfy these and other requirements for information on real property, the naval facility assets data base (NFADB) has been established. The NFADB contains the records of all land, buildings and structures owned and ingranted by the Navy and Marine Corps. It gives detailed information on all properties including: location, cost to government, how and when acquired, the uses, users and condition of the property. Approximately 50 pieces of data are maintained for each property.

The information is retained at the Facilities Systems Office (FACSO) located at the Naval Construction Battalion Center, Port Hueneme, Calif., and can be sorted and printed in many formats. Shore activities are provided reports which pertain specifically to their properties. For other users, summaries by installation, naval district or states are more useful. Fifteen reports are printed on a regular basis and approximately 50 special reports are available on request.

Many sources are responsible for the input and maintenance of information which makes up the NFADB. Upon acquisition, a record must be created to report physical and fiscal data. In the event of purchase or transfer of existing land or buildings, the Engineering Field Divisions (EFD) have easy access to the required data. When new construction occurs the officers in charge of construction (OICCs) are responsible for transmitting timely accurate physical data to the NFADB. Input of changes to fiscal data are sent for reconciliation with plant property financial accounts. Once information is in the data base, shore activities and EFDs have joint responsibility for its maintenance. EFDs are responsible for use, user and condition data required for the Shore Facilities Planning System. Activities are responsible for maintaining all other data with validation accomplished on a three year cycle.

Once information is entered for a specific property it might be surmised that changes to the data would be infrequent. Yet, in FY76, 208,100 changes were made to the NFADB. These changes ranged from change of building use to an activity name change.

Despite detailed attention, the sheer number of properties and participants has created a system not without problems. Each new participant must become familiar with the Navy Facility Assets Data Base Manual (NAVFAC P-78). Problems have arisen from somewhat cumbersome reporting procedures which have resulted from incremental changes to the system over the years.

NAVFACHQ, FACSO, the EFDs and the shore activities are presently working on a clean-up effort with the aid of computer generated exception reports to purify the system.

On line terminal access will soon be provided to the EFDs to allow faster and easier systems for input and update, allowing those with the first-hand knowledge to be closer to the data base.

NAVY CIVIL ENGINEER

This index of articles appearing in The Navy Civil Engineer in 1977 is published for reference purposes. The first section of the index is by edition with an alphabetic listing by author. The second section lists articles alphabetically under general categories with edition date and page number shown.

1977 INDEX FIRST SECTION

Spring of 1977

BABCOCK, Elizabeth . . . . . Designing For The Desert
BELL, Warren M., CDR, CEC, USN . . . . . 'Incrementation' Is Becoming The Latest 'Dirty Word'
COWAN, R. F., LT, CEC, USNR-R . . . . . The Effective Site Visit
CRIGLER, Donald . . . . . A Solar-Heated Hospital
GRUPE, Wayne R. . . . . Command Management Plan — '60s Dreams, '70s Realities
HEIN, F. E. . . . . Metrication: It's Time For Us To Put Our Best .3048m Forward
JOHNSON, Ronald . . . . . A Solar-Heated Hospital
LEIMANIS, John J. . . . . Keeping Ships Moored Can Be Complicated . . . And Costly!
MARSCHALL, A.R., RADM, CEC, USN. . A Farewell From Topside
MURPHY, T. C. . . . . Opinion And Outlook: A View Of Military Unions
NAVFAC Staff . . . . . NAVFAC Situation Report
O'CONNELL, Brian J., LCDR, CEC, USN . . . . . Kings Bay, Ga., A Proposed Major FBM Submarine Base Site
PIZZANO, Robert, C., LT, CEC, USN . . . CECOS To Harvard: A Wealth of CEC Education Opportunities
RENZETTI, J. L., LCDR, CEC, USN . . . . Dismantling McMurdo's Reactor
SPECK, William H. . . . . Advice Of Counsel — National Environmental Policy Act of 1969
TUNSTALL, Reginald . . . . . Containing Oil Spills
Unsigned . . . . . CECOS Basic Class No. 142
Unsigned . . . . . Powered Tagline Eases Container Transfer Task
Unsigned . . . . . Public Works Technical Notes
Blind Fastener
Window Air Coolers Rating
Infrared Scanning System
Long Term Storage For Buildings
Moisture-Resistant & Mildew-Resistant Coatings
Light Dimmer
Battery Ratings
Telespection System
Linoleum Repairing

Summer of 1977

BARRETT, Gerard J., LT, CEC, USN. . . . Project Managers & Management
BRADLEY, Harry E., Jr. . . . . Unit Pricing Estimating Guide
CLEARWATER, J. L., CDR, CEC, USN . . Amphibious Operational Readiness
DAVIS, Douglas D., JO2, USN . . . . . Thousands Complete Gulfport's Naval Construction Training
D'EMIDIO, J. A., CAPT, CEC, USN . . . . . O & M — Keeping The Navy's Shore Establishment Afloat
FEGLEY, C. E., III, CDR, CEC, USN . . . Seabees CAN manage!
FOUNTAIN, Joe, JO3, USN . . . . . Seabees and the Puerto Rican scene
GAMMON, James A. . . . . Pollution And The Navy
GAWARKIEWICZ, J. J., III, CDR, CEC, USN . . . . . The Civil Engineer Corps in 1977
GROVER, R. G., JO3, USN. . . . . Students At NCTC Port Hueneme
GUILD, C. J., LT, CEC, USN . . . . . The Civil Engineer Corps In 1977
HOLLOWAY, James L., III, ADM, USN . . "... the Naval Facilities Engineering Command is in good hands!"
ISELIN, Donald G., RADM, CEC, USN. . . Speaking From Topside
LUCAS, John A., Jr., LCDR, CEC, USN . . . . . NEPSS . . . toward a cleaner environment
MARSHALL, J. G., CDR, CEC, USN . . . . Facilities Maintenance Division
McMAHON, Gerald, CAPT, USAF . . . . . A View From Out Of The Blue
McNEILL, J. E., CDR, CEC, USN . . . . . NMCB-3 vs Typhoon Pamela
MILKINTAS, J. C., LCDR, CEC, USN . . . Seabees CAN manage!
MONTOYA, B. F., CDR, CEC, USN . . . . NEPSS . . . toward a cleaner environment
MURPHY, T. C. . . . . Opinion And Outlook: 'Everyone Ought To Read This Article'
NAVFAC Staff . . . . . NAVFAC Situation Report
OLSON, David L. . . . . Pollution And The Navy
OSTAG, William P., ENS, CEC, USN. . . . NMCB-40 on alert
PELTIER, E. J., Jr., CDR, CEC, USN . . . Power To The Fleet!
RIGHTMER, R. E. . . . . Fire Safety For NAVFAC
RODGERS, Charles A., Jr. . . . . Managing Environmental Programs
SULLIVAN, P. A. . . . . Managing Public Works Centers
Unsigned . . . . . CECOS Basic Class No. 143
Unsigned . . . . . CECOS FY78 Course Schedule
Unsigned . . . . . Public Works Technical Notes
Sun Power for Fuel Savings
Preservation of Wood Water Tanks
Matrication
Steam and Water Analysis Programs
Moisture Meter for Roof Inspection
New Shower Heads for Saving Water
Smoke Detectors
Unsigned . . . . . Readers Survey Form
WALL, S. J. . . . . Getting From Here To There
WESTON, Alan, JO3, USN . . . . . Fighting Seabees? They're still with us . . .
YAROSCHAK, Paul J. . . . . Training Pollution Control Workers

Fall of 1977

ARTHUR, R. Sidney . . . . . Two Sides Of The Tax Coin
CHECKOVICH, James K., LT, CEC, USN . . . . . Automating Building Service Systems
CLEMENTS, Neal W., RADM, CEC, USN . . . . . Speaking From Topside
ELKINS, John C., LCDR, CEC, USN . . . . Navy Construction In FY78
EPPERLY, Paul J., LCDR, SC, USN . . . . Making BEQs-BOQs More Livable
GARBE, Warren M., CDR, CEC, USN . . . Navy Construction In FY78
KNUEVEN, John . . . . . Family Housing Responsibility Adjusted
LEPPEK, Christopher, JO2, USN . . . . . Getting Gear Ready For A Cold Winter
MOORE, Jon. . . . . Family Housing Responsibility Adjusted
MURPHY, T. C. . . . . All Volunteer Force
NAVFAC Staff . . . . . NAVFAC Situation Report
REGEN, Sid . . . . . NAF Funds For Recreation
RISPOLI, James A., LT, CEC, USN . . . . The environment during construction
SAYNER, W. V., Jr., LCDR, CEC, USN. . 'Purchase And Removal' Pays Off
SPECK, William H. . . . . Advice Of Counsel — Truth In Negotiation
SPENCER, E. B. . . . . UCT-2 Installs Undersea Cables
SPENCER, J. E., LT, CEC, USN . . . . . Surviving As A Staff Corps Officer
TALMADGE, C. Eugene, LT, CEC, USNR . . . . . Japanese Housing Is Getting Sky-High
TAPLIN, Harry R. . . . . Boilers Healthy? Better Check Again!
TUNSTALL, Reginald V. . . . . CESO And Standardization
Unsigned . . . . . Advanced Ocean Construction Techniques
Smooth Navy Combat Pilot Training
Unsigned . . . . . CEL Has A 'Bladder' Idea!
Unsigned . . . . . Deployments For Seabee Team 4010 Are 'Remote' Prospects
Unsigned . . . . . New CEL Test Of Concrete Spheres
Unsigned . . . . . Public Works Technical Notes
Eliminate Scaffolds And High Ladders
Energy Savings Tips For Water Heaters
Temporary Pavement Markings
Dust Control
Electrical Maintenance
Unsigned . . . . . Readers Survey Results
Unsigned . . . . . "reflecting the finest Naval traditions"
Unsigned . . . . . A Rolling Lab Gathers Data
Unsigned . . . . . Seabees — Around The World
WILLIAMS, John . . . . . Surveys To Save Energy And Money
WU, Arthur H. . . . . Landfill Stabilizes Academy's River Front

Winter of 1977

BAER, George E. . . . . Post Occupancy Studies
BOSLEGO, Barbara . . . . . Facilities Asset Data
CARBERRY, James J. . . . . Economic Analysis Of Overseas Family Housing
DIRKS, Jack . . . . . An Anatomy Of A Master Plan
GAWARKIEWICZ, J. J., III, CDR, CEC, USN . . . . . Encroachment
MYERS, Robert E. . . . . Shore Facilities Planning System
NAVFAC Staff . . . . . NAVFAC Situation Report
PLEDGER, Donald B. . . . . Capital Improvement Plan
PRAHL, Charles S., LCDR, CEC, USN . . Staff Civil Engineers
RHODE, Francis E. . . . . Study The Entire Mediterranean
SEARS, K. P., RADM, CEC, USN . . . . . Speaking From Topside
SIMS, John G., LT, CEC, USN . . . . . When A Community's Plans Disagree With The Navy's
Unsigned . . . . . Memorials: RADM A. C. Husband and RADM R. H. Meade
Unsigned . . . . . NAVFAC/CEC/Seabees Family Album '77
WILLIAMS, J. N. . . . . San Diego's 'Total Energy' Plant
WOODS, W. J. . . . . Acquisition Of New Naval Properties

NAVY CIVIL ENGINEER

SECOND SECTION 1977 INDEX

General Features

All Volunteer Force ..... Fall-p. 26
A Farewell From Topside ..... Spring-p. 23
Keeping Ships Moored Can Be Complicated . . . And Costly! ..... Spring-p. 18
Metrication: It's Time For Us To Put Our Best .3048m Forward ..... Spring-p. 29
". . . the Naval Facilities Engineering Command is in good hands!" ..... Summer-p. 31
"reflecting the finest Naval traditions" ..... Fall-p. 24
NAVFAC/CEC/Seabees Family Album '77 ..... Winter-p. 16
Speaking From Topside ..... Summer-p. 62
..... Fall-p. 47
..... Winter-p. 30
Surviving As A Staff Corps Officer ..... Fall-p. 40
Two Sides Of The Tax Coin ..... Fall-p. 4

Construction, Facility

Advanced Ocean Construction Techniques Smooth Navy Combat Pilot Training ..... Fall-p. 44
Designing For The Desert ..... Spring-p. 21
Dismantling McMurdo's Reactor ..... Spring-p. 26
Economic Analysis Of Overseas Family Housing ..... Winter-p. 15
The Effective Site Visit ..... Spring-p. 11
Japanese Housing Is Getting Sky-High ..... Fall-p. 20
Kings Bay, Ga., A Proposed Major FBM Submarine Base Site ..... Spring-p. 4
Making BEQs-BOQs More Livable ..... Fall-p. 18
NAF Funds For Recreation ..... Fall-p. 29
Post Occupancy Studies ..... Winter-p. 14

Facilities Planning and Design

Acquisition Of New Naval Properties ..... Winter-p. 7
Capital Improvement Plan ..... Winter-p. 6
Encroachment ..... Winter-p. 4
An Anatomy Of A Master Plan ..... Winter-p. 12
Shore Facilities Planning System ..... Winter-p. 18
Study The Entire Mediterranean ..... Winter-p. 20
When A Community's Plans Disagree With The Navy's ..... Winter-p. 10

Management

Automating Building Service Systems ..... Fall-p. 21
Command Management Plan — '60s Dreams, '70s Realities ..... Spring-p. 28
Facilities Asset Data ..... Winter-p. 25
Family Housing Responsibility Adjusted ..... Fall-p. 43
Navy Construction In FY78 ..... Fall-p. 13
Project Managers and Management ..... Summer-p. 24

Public Works

Facilities Maintenance Division ..... Summer-p. 5
Fire Safety For NAVFAC ..... Summer-p. 23
Getting From Here To There ..... Summer-p. 13
Getting Gear Ready For A Cold Winter ..... Fall-p. 43
Managing Public Works Centers ..... Summer-p. 21
O & M — Keeping The Navy's Shore Establishment Afloat ..... Summer-p. 4
Power To The Fleet! ..... Summer-p. 10
Public Works Technical Notes ..... Spring-p. 41
..... Summer-p. 35
..... Fall-p. 27
'Purchase And Removal' Pays Off ..... Fall-p. 8
Unit Pricing Estimating Guide ..... Summer-p. 8

Seabee Features

Amphibious Operational Readiness ..... Summer-p. 54
Fighting Seabees? They're still with us ..... Summer-p. 51
NMCB-3 vs Typhoon Pamela ..... Summer-p. 44
NMCB-40 on alert ..... Summer-p. 47
Seabees and the Puerto Rican scene ..... Summer-p. 46
Seabees CAN manage! ..... Summer-p. 49
Students At NCTC Port Hueneme ..... Summer-p. 57
Thousands Complete Gulfport's Naval Construction Training ..... Summer-p. 56
A View From Out Of The Blue ..... Summer-p. 52

Seabee Operations

Deployments For Seabee Team 4010 Are 'Remote' Prospects ..... Fall-p. 29
Seabees — Around The World ..... Fall-p. 11
UCT-2 Installs Undersea Cables ..... Fall-p. 16

Technical

Boilers Healthy? Better Check Again! ..... Fall-p. 37
CESO And Standardization ..... Fall-p. 38
Landfill Stabilizes Academy's River Front ..... Fall-p. 41

Energy

San Diego's 'Total Energy' Plant ..... Winter-p. 28
A Solar-Heated Hospital ..... Spring-p. 8
Surveys To Save Energy And Money ..... Fall-p. 9

Environmental

Containing Oil Spills ..... Spring-p. 20
The Environment During Construction ..... Fall-p. 30
Managing Environmental Programs ..... Summer-p. 17
NEPSS . . . toward a cleaner environment ..... Summer-p. 16
Pollution And The Navy ..... Summer-p. 18
Training Pollution Control Workers ..... Summer-p. 19

Research and Development

CEL Has A 'Bladder' Idea! ..... Fall-p. 15
New CEL Test Of Concrete Spheres ..... Fall-p. 7
Powered Tagline Eases Container Transfer Task ..... Spring-p. 22
A Rolling Lab Gathers Data ..... Fall-p. 8

Professional Development

CECOS To Harvard: A Wealth Of CEC Education Opportunities ..... Spring-p. 15
The Civil Engineer Corps In 1977 ..... Summer-p. 26
'Incrementation' Is Becoming The Latest 'Dirty Word' ..... Spring-p. 32
Staff Civil Engineers ..... Winter-p. 8

Schools/Training

CECOS BAsic Class No. 142 ..... Spring-p. 46
CECOS Basic Class No. 143 ..... Summer-p. 42
CECOS FY78 Course Schedule ..... Summer-p. 30

NAVFAC Reports

NAVFAC Situation Report ..... Spring-p. 39
..... Summer-p. 41
..... Fall-p. 35
..... Winter-p. 24

Advice Of Counsel

National Environmental Policy Act of 1969 ..... Spring-p. 20
Truth In Negotiation ..... Fall-p. 14

Editorial

Memorials: RADM A.C. Husband and RADM R. H. Meade ..... Winter-p. 23
Opinion And Outlook: A View Of Military Unions ..... Spring-p. 38
Opinion And Outlook: 'Everyone Ought To Read This Article' ..... Summer-p. 60
Readers Survey Form ..... Summer-p. 39
Readers Survey Results ..... Fall-p. 23

San Diego's 't

By J. N. WILLIAMS, P.E.
Energy Programs Branch
NAVFAC HQ

The high cost of energy has led to an increased number of *total energy plants*, which provides a logical and economical production of power. One of these, at the San Diego Naval Complex, provides Naval and Marine recruits total-energy in the form of electricity and steam from a central dual-energy plant. Total-energy plants (TEP) generate more than one form of usable energy from a fuel source. They are designed to produce various combinations of electricity, steam, hot water, and chilled water. Like the proverbial meat packing plants, (that utilize everything but the squeal), total-energy plants squeeze out the maximum heating value of a fuel before discharging any residual heat to the atmosphere.

The San Diego dual energy plant is located on the Naval Training Center property, but is operated by Applied Energy, Inc., a subsidiary of San Diego Gas & Electric Company (SDG&E).

The plant includes a 20,000 KW, natural gas fired, turbine electric generator and a 140,000 pounds-per-hour boiler. The turbine's hot exhaust gases are not discharged into the atmosphere, instead the valuable heat is retained in a heat-recovery steam boiler. The thermal efficiency of this dual energy system is increased to approximately twice the efficiency of a typical electric generating plant.

Prior to the construction of the new TEP, the Naval Training Center and Marine Corps Recruit Depot produced steam in separate boiler plants, and purchased electricity from the SDG&E electrical distribution system.

Rather than invest $5 million to replace the two aging steam plants, the total energy concept was adopted by the Navy as a more economical alternative. The utility company benefits from an additional source of revenue (sale of steam), and the Navy saves operational and maintenance funds. With current fuel costs, the annual savings approach $250,000 by selecting the total-energy alternative. Two similar plants in the San Diego Naval Complex promise further savings. One was placed in operation in 1976 at the San Diego Naval Station, and the other is under construction at the Naval Air Station, North Island.

To conserve natural gas, diesel fuel oil was selected as the energy source for the newer plants.

Total-energy plants are not new to the Department of Defense, which pioneered them for the Distant Early Warning (DEW) Line installations in the Arctic Circle in the 1950s. The Navy has several large installations where steam is extracted from steam turbine electric generation cycles and used for industrial purposes which are essentially total-energy applications. Navy ships also have combined steam and electric generation systems. Consequently, former Navy shipboard engineering personnel are excellent prospects for operators of total-energy plants.

Energy conservation surveys by engineers from each NAVFAC engineering field division (EFD) are continuing the search for feasible applications of the total-energy concept, including the use of solid waste as fuel.

As with all energy systems there are aspects that must be carefully evaluated to assure economical operation for decades of operating life. One of the first considerations is whether or not the local electrical utility company has the logistical capability, financial incentive, and desire to operate a total-energy plant on or adjacent to a military installation.

The alternative of the Navy operating a government constructed plant with its own personnel may not be feasible if the activity already has inadequate personnel staffing. Also, the generation of electricity may require new personnel skills for some activities, and even where electricity is already generated by an activity, such independent generating plants are inherently not as dependable for uninterrupted power as our national network of interconnected electrical distribution lines. However, some plants have improved their service reliability by including a tie-in with their local electric utility for purchase of supplementary electricity, or for emergency loads. The tie-in permits sale of surplus electricity generated by the total-energy plant during periods of low consumption, and such a contract arrangement can often significantly improve the economical amortization of a total-

'total energy' plant

energy plant. This cooperative arrangement, or modified total-energy concept, is frequently called a selective energy system.

Selective energy can provide on-site electrical generation supplemented with purchased commercial electricity to permit the design capacity to balance the thermal steam demands with electrical loads so that the system efficiency is economically maintained. Normally the thermal demands will establish the design electrical capacity of the plant, and such a balance can result in an overall system efficiency as high as 75%, a vast improvement over other alternatives. Cooperation with the electric company also enables the selective energy plant to serve as a standby emergency power plant during commercial electrical blackouts.

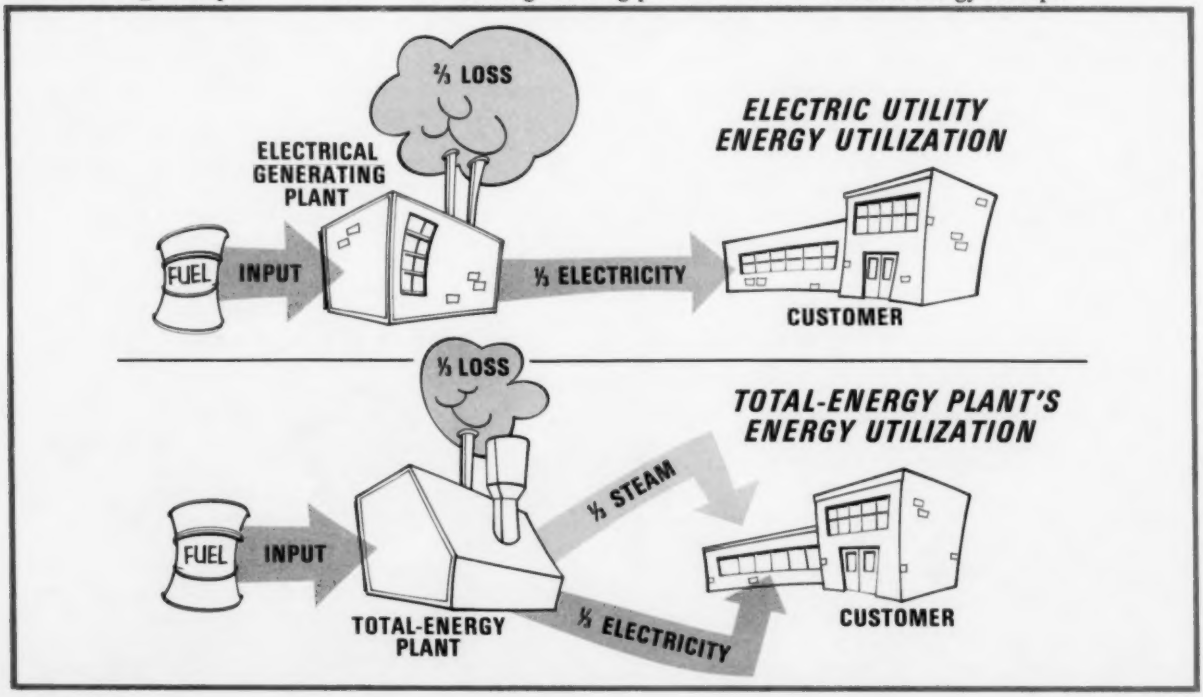
Selective energy design is being considered for application at various naval locations. Three forms of usable energy are being evaluated: high temperature water for heating and domestic use, chilled water from an absorption chiller for air conditioning, and electricity within a switchable connection to commercial electric power for variable proportions of on-site electrical generation and purchased electricity.

Cost of such installations is often high, relative to the cost of extending existing utility lines but annual energy savings can provide attractive amortization paybacks. Total energy benefits include ecological enhancement of the environment by elimination of high voltage transmission lines, reduction of smoke emissions, and avoidance of large thermal discharges.

Approximately 2/3 of the heat from an electrical generating plant and distribution system is discharged into the atmosphere or into streams, and only 1/3 becomes usable energy for the customer. This ratio varies in different geographic locations and also depends on the size of the generating plants and the voltage and mileage of the distribution lines. Even the most efficient utility will not reach 40% efficiency when the substation and transmission losses are included.

Several hundred *total and selective energy plants* are now operating throughout the United States at shopping centers, college campuses, hospitals, apartment buildings, and other large commercial and industrial facilities. Such systems provide greater fuel economies, and stretch fuel supplies towards their maximum limit of efficient utilization as fuels.

Accordingly, the Department of Defense has issued instructions to evaluate the feasibility of total and selective energy systems for all large new facilities constructed in the military construction program. The design of such facilities must consider all practical techniques of energy conservation, energy recovery, and energy storage which may enable long-term economic adoption of either the total or selective energy concept.



SPEAKING FROM TOPSIDE

A homecoming fo

It is like coming home.

I am happy and proud to be back in NAVFAC as the Vice Commander. Happy because of the opportunity to again work with many fine friends. Proud because, after working with all the Services for 3½ years in the Office of the Secretary of Defense, I've come to the conclusion that NAVFAC is one of the finest organizations in the Department of Defense.

How did I conclude this? It's simple. NAVFAC knows its job and gets it done. Our organization avoids some of the typical, large organization bureaucratic stumbling blocks. We work together and communicate. Job enrichment is not a text book term to NAVFAC. We use it. Perhaps the practice that contributes most to getting the job done is placing responsibility and authority at the lowest organizational level commensurate with capability and regulatory requirements.

NAVFAC's Command Management Planning process is years ahead of most corporate management systems that I have observed elsewhere in other DoD organizations. True, we may be applying some old, sound principles and one may ask what's new, but the fact is that these principles never escape the pages of text books in many organizations. Many principles of the "in" techniques such as Zero Base Budgeting, Mission Budgeting, and Organizational Development have been and are in operation in NAVFAC. But management is only a process. We are in business to provide services and products. So, I will move on and comment on those things that I observe that make NAVFAC stand among the best in the Department of Defense.

Operating and maintaining the shore establishment is big busness and the Public Works Centers are shining examples of how to do it efficiently and economically. The PWC corporate management system rivals any in the private sector. It provides a model for NIF operations in all of the services. Across the board, I think that NAVFAC excels in the public works arena. The technical and management guidance that we provide has been significant in the Navy's efforts to turn the corner towards bringing our facilities up to snuff. Record RPMA budgets have been the result of Navy inputs and justifications that were worked up by NAVFAC.

Pollution, air quality, water quality and the environment are all active concerns of our society. The DoD was charged to take the lead in these areas. In my view Navy has led the country, and that means NAVFAC. Our technical and management initiatives have been held up as examples to emulate. NAVFAC's energy engineering and conservation programs rate and have received the same kind of recognition. Why have we achieved such success? We have more than programs, we have results to show. Those results have put us out in front of many other government organizations.

If you have noticed the recent headway we've made in the Navy's civil engineering support equipment fleet, you know that we are doing a good job. Procurement budgets in this area are the highest in 15 years. That happened because we did an outstanding job articulating the requirements. Remember, we got those increases while there was a real budget squeeze on.

I can't conclude my discussion of the Public Works program without commenting on MUSE. Cold Iron, emergency requirements, you name it; MUSE has been called to respond. And it always did. A 'CAN DO' performance that I think has been the greatest.

If we do anything better than public works, it's construction. Quality and timeliness are the watch words of our Construction Program and that's what makes us good. NAVFAC always stands proud when measured against OSD construction goals. We executed 88% of the FY77 MCON in FY77 and the total work in place was one billion dollars. The first FY78 MCON project was awarded on the first day of the fiscal year. That has never happened before. The execution rate is only exceeded by the quality of construction. Construction is our most visible product, and I think we are good.

The construction program is preceded by MILCON programming and engineering and design. Consider MILCON programming. The essence of the programming is deciding what is needed and then articulating the need to OSD, OMB and the Congress. It is an extremely complex task. NAVFAC's success rate of about 95% is testimony to our performance here. The size of the program has shown real growth in the past few years. More critical facility needs are being satisfied. The amazing thing to me is that this happened while the size of the MILCON Programming staff decreased to about one half of its original size because of personnel reductions. A genuine example of NAVFAC's productivity.

Engineering picks right up on the programming. The two actually have to work together to make sure that technical concepts, cost estimates and final designs yield the required products within budget and schedule. Engineering carries on the success of the programming. Specifications and standards are a big part of the total acquisition effort. We often hear people say: "Why can't the Government write good specifications or standards?" Well, NAVFAC does. A large part of our success is due not only to the engineering ability of our people, but also to our ingenuity in using technical society standards and federal construction guide specifications and also coordinating NAVFAC design criteria with industry.

for the vice commander

We are displaying leadership in areas such as guide specifications for energy monitoring and control systems.

We are also moving ahead in the use of computers to aid in design, cost engineering and specifications. This progressive attitude is reflected in the quality of our designs which is attested by the AIA and DoD awards NAVFAC has won for excellence in architecture and engineering. The high level engineering consultation that our consultants provide in the areas of structures, geotechnical engineering, offshore facilities, waterfront structures, metallurgy and petroleum facilities all mark NAVFAC's engineering excellence.

We stand out in hyperbaric certifications too. The Ocean Simulation facility at the Naval Coastal Laboratory, Panama City, Florida, was certified by NAVFAC in February 1975 for manned operation to full depth. This facility is the largest in the world for studying diving physiology and diver equipment. The main chamber is 45 feet in length and ocean depths to 2250 feet can be simulated.

The Seabees always do their typically outstanding job. Their performance on the diverse and geographically dispersed peacetime projects speaks for itself. A complete Naval facility on Diego Garcia; recovery from a super-typhoon on Guam; housing for Vietnamese refugees; jobs throughout Europe and the Pacific; and underwater construction projects, worldwide, give one an idea of Seabee deployments. All of these are success stories. The real success has been the Seabees' ability to improve and maintain combat readiness. The integration of the Active and Reserve Seabees stands alone among reserve communities in this regard.

We have a 25 battalion force, 8 active and 17 reserve, that is working as a unit to insure that it can be deployed when needed to accomplish the construction that would be expected in a contingency operation. The Facilities Engineering Program component of the reserve program also deserves a well done. The FEP operation is a unique success story in the organization, training and use of reserves that are not directly associated with combat units. The total Seabee force reflects the imaginative guidance and direction of NAVFAC and the Chief of Civil Engineers.

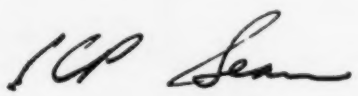
NAVFAC's research program has always been impressive but I have noted two recent and significant advancements that I think place our program among the best. First, the Facilities Strategy that has been developed is a dynamic planning tool for both the researchers and field customers, and guides us to research areas that will lead to products. Second, our program has developed a good balance between technology base effort and product oriented effort. NAVFAC R&D is not only meeting today's needs, it is also anticipating those of tomorrow.

Facilities Planning and Real Estate headline this issue of *The Navy Civil Engineer.* You can see that we do well here too. Our Master and Regional Planning stand with any of the best that I have seen. I was always proud of NAVFAC work that reached OSD. An example that comes to mind is the National Capital Region Study. Real estate is a tough and political arena. Our success rate in acquiring and disposing of property to meet the Navy's needs attest to a splendid performance. The Natural Resources Program has been a winner from the start. The many DoD conservation awards won by Naval activities underscore our success in this field.

Behind our performance in all the areas that I have mentioned stand the people and organizations that handle the supporting administrative tasks. We could not succeed without them. Budgeting, training, accounting, travel . . ., the list goes on. They are always there to help the operation. Their orientation to customer service is extraordinary. It is a characteristic that I have not found everywhere.

Our people programs stand out in their contribution to operations. Equal employment opportunity is part of our way of doing busines; in other organizations EEO seems to be a separate program. The PDC Program is almost a one of a kind success story. People are an organization's most important asset. NAVFAC knows that. Our staff, Headquarters and field, civilian and military, are professionals from the first to the last person. I have not seen better in the DoD.

Yes, I am glad to be back with the Navy and in NAVFAC. I am proud of NAVFAC. I say without reservation that NAVFAC stands with the best. You should be just as proud of your accomplishments!



Rear Admiral K. P. SEARS, CEC, USN
Vice Commander Naval Facilities Engineering Command

An invitation to young graduate engineers to join the young professionals of the U.S. Navy

CIVIL ENGINEER CORPS

Construction and maintenance of the Navy's shore and support installations is just one of the responsibilities of the engineer managers of the Navy's Civil Engineer Corps. And qualification is not limited to the civil engineering discipline, as the Corps requires graduate engineers of mechanical, chemical, electrical, industrial and construction disciplines and architecture too! As a commissioned officer of the U.S. Navy the young engineer is offered greater opportunity to develop quickly a professional career with the added potentialities of an exciting overseas assignment, professional registration and graduate studies! The young officer may be assigned to construction contract administration, public works management or with a Naval Mobile Construction Battalion, the historic Seabees, plus many individual and unique positions.

Engineering students and counselors are invited to explore the multifaceted world of the Navy's Civil Engineer Corps by contacting their local Navy Recruiter for specific details. An informal visit with a Civil Engineer Corps officer to discuss the personal and professional benefits of a Navy career can be arranged by the same Navy recruiter or by calling or writing the Naval Facilities Engineering Command, (ATTN Code 09MA1), 200 Stovall Street, Alexandria, Va., 22332 Telephone: (202) 695-3635.

Call toll-free 800-841-8000 now if you desire instant information from the Naval Recruiting Command. If you're a good student, and want to be a better engineer, the chances are you'll do best by investigating the Civil Engineer Corps of the U.S. Navy.

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